The Newspaper of Information Systems Management
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COMPUTERWORLD

Access Health, Inc.'s John Determan *took intranet cost-justification to new heights, calculating details such as time spent walking to and from meetings*

Figuring dollars, sense of intranets

By Kim S. Nash

Information systems managers have been busy setting up company intranets, surprisingly free of pesky cost-justification demands, an exclusive *Computerworld* survey indicates.

Of the 100 IS professionals surveyed, 63% said they were given the green light to build intranets without having to show a return on investment. Intranets are applications that make internal, secured use of Internet technologies such as TCP/IP networks and World Wide Web browsers.

Why is cost-justification no big deal? Intranets often don't require extra hardware, and software is often free or close to it, respondents said. Plus, many webmasters don't seem to mind giving up personal time to work on these popular projects.

But don't dare relax.

As intranets become part of mission-critical computing, IS will need to know how to handle scrutiny from beady-eyed bean counters about the costs and payback of this glamorous new technology.

"Anyone who thinks they can do anything real with an intranet without running the hard dollars is

Intranets, *page 109*

Check out more survey results at Computerworld's Web site at . . .
www.computerworld.com

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Turning point

Microsoft eyes Java threat; will license Office language

By Sharon Gaudin and Frank Hayes

Microsoft Corp. is trying to slam the door on Sun Microsystems, Inc.'s Java by offering to license the scripting language from its Microsoft Office application suite, *Computerworld* has learned.

Microsoft will announce at Comdex/Spring '96 on June 4 that it will let software vendors build support for Visual Basic for Applications directly into their products and link them with Microsoft's popular Word and Excel programs.

The idea is to blanket the cross-platform language market with Visual Basic, sources said. In

VBA, *page 14*

Migration to Visual Basic 4.0 stymies corporate developers

By Frank Hayes and Sharon Gaudin

Visual Basic

Users of Microsoft Corp.'s Visual Basic 4.0 are finding the development system tough going — so much so that some corporate developers are giving up on using VB 4.0 for anything but new applications targeted at Windows 95 and Windows NT.

VB 4.0, which began shipping last fall, was designed for 32-bit versions of Windows. But on Windows 3.1, VB 4.0 applications run slower and demand more memory than VB 3.x versions of the same programs, users said. That's a real problem, given the hold Windows 3.1 continues to have on corporate accounts.

Visual Basic, *page 14*

Smokin' modems

By Bob Wallace and Mindy Blodgett

Facing up to user complaints, remote computing vendor U.S. Robotics Corp. last week confirmed it has been repairing or replacing PC modem cards for the past several weeks.

U.S. Robotics officials downplayed what some users are calling a chronic overheating problem with the Courier and Sportster PC modems. The vendor said the problem has affected only a few Courier cards and stressed that no recall is under way.

Heat is the cause

But the underlying cause of the problem may reach beyond U.S. Robotics.

The heat generated by the newest, fastest chips is creating an ongoing design problem for makers of notebooks and laptop peripherals, said Bill Lempesis, director of the

Modems, *page 16*

3Com pulls switches

By Bob Wallace

Leader of the hub

On the strength of sales of the LANplex 2500 and the larger 6000, 3Com led the 1995 chassis hub market with 37% of revenue and 35.2% of ports shipped, The Dell'Oro Group said.

Switching kingpin 3Com Corp. is quietly replacing thousands of its LANplex 2500 data center switches because of a flaw in a 25-cent component that has paralyzed some networks, according to documents obtained by *Computerworld*.

3Com officials last week confirmed they identified the power cable defect late last year and are roughly 70% of the way through a sweeping replacement program that

3Com, *page 15*

Give us direction!

Computerworld's **Annual Job Satisfaction Survey** reveals a restless crew, weary of reengineering and wishing their managers would grab the helm.

See **Careers,** page 88.

Satisfied with your job? Take our QuickPoll at www.computerworld.com

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Inside Computerworld

May 27, 1996

News

NEWS

Microsoft Access problems
Some Access database users are running into regular systems crashes.

Attacked!
Department of Defense computers were attacked 250,000 times last year, investigators told a Senate hearing last week.

Corel & Java
Corel plans to deliver an integrated suite of Java-based applications.

NotesView concerns
NotesView, Lotus' management software for Notes networks, is taking a hit from customers who say it doesn't scale well.

Diversion alert
Multiplayer, Web-based games are coming this summer, maybe to a desktop in your company.

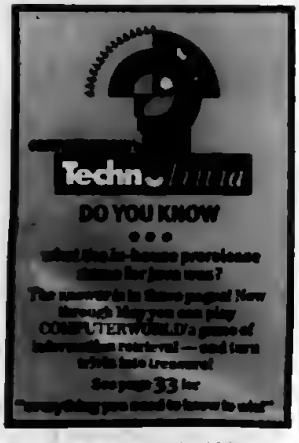
Subscription pricing
Users soon may be buying software via the Internet in a new way.

Preintegrated apps
Marcam and Coda are first to market with preintegrated client/server applications.

OPINION

Flashback
It's deja vu with the network computer, Paul Gillin says. Another would-be standard exists for all the wrong reasons.

Visible decisions
Technology guru James Martin urges IS to wake up to the world of data visualization — beyond pie charts and spreadsheets.



Atlanta 1996

Let the games begin

Meet Robert Neal *(pictured)*, captain of the information systems team for the Atlanta Olympics, and four of his key players

See Managing, page 74

Technical Sections

SERVERS & PCS

HP in the chips
Hewlett-Packard is changing more than just the chips in its high-end server line.

Mainframe-like storage
Amdahl's new Unix- and Windows NT-compatible storage arrays pack high-end throughput and reliability.

SOFTWARE

Don't be a SAP
Buyer beware in the market for R/3 consulting services. Quality and expertise vary from vendor to vendor.

THE ENTERPRISE NETWORK

Web-managed networking
Network administrators welcome Web-enabled management tools.

Ditching the dish?
Network managers ponder the jump from satellites to frame relay.

THE INTERNET

Apple's 'net strategy
Apple's new recipe for success leaves some users hungry for more.

DCE help
Gradient's tool tries to tame the Distributed Computing Environment monster.

CORPORATE STRATEGIES

Software distribution
The owner of the world's largest data communications network is updating its software the new-fangled way.

The Cold War, Part II
Economic espionage against U.S. firms is rising, but federal criminal laws are woefully inadequate to deal with it.

Features

MANAGING

IS at the Olympics

IN DEPTH

Life at a cybersalon

CAREERS

How satisfied is IS? Check out *Computerworld* survey results and see.

MARKETPLACE

PC price cuts
A new round of price-cutting spawns tough choices for PC buyers.

FINANCE & INVESTING

Come hither
The New York Stock Exchange beckons to Nasdaq's high-tech companies.

welcome to the

CYBERSALON

How does computing affect your life? *Your kids' lives? Society? To meet some people who're probing these issues, eavesdrop on a cybersalon.*

See In Depth, page 81.

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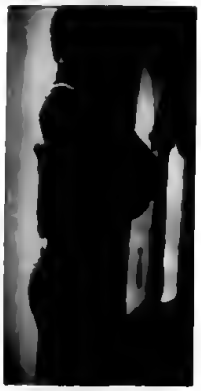


Hype aside, everyone knows that personal digital assistants (PDA) don't really fit in your shirt pocket. So, what's a road warrior to do? Opus 63 Design Lab in Long Island City, N.Y., has developed a line of underarm and hip holsters for hands-free storage of electronic gadgets. The leather Pocket Liberator Palmtop Holster, for example, costs $48 and is said to be "virtually undetectable under an unbuttoned suit jacket." Strap on more than one to achieve what the firm calls "The Body Office."

Information technology purchases will increase at a 16% compound annual growth rate and reach $1.3 trillion by 2000, according to Gartner Group projections cited in a report distributed by InfoEdge in Stamford, Conn.

Officials at Bell & Howell in Skokie, Ill., say the company held the first live Internet broadcast of an annual stockholders meeting. Internet-savvy shareholders who couldn't attend the May 16 meeting in Ann Arbor, Mich., could listen to audio presentations and submit questions via electronic mail.

Call it the catch-22 of applets. Interpose's Cost of Network Downtime Calculator lets you enter data such as your company's annual revenue, hourly labor rates and the number of network outages and then calculates the costs of network downtime. The calculator is a Java applet downloadable from **www.interpose.com.** If you guessed this is a sales tool, give yourself 10 extra points. As the calculator spins its gloomy numbers, it can also store information about you in a lead-tracking database. — *Robert L. Scheier*

An Australian doctor has developed computer software for terminally ill patients to control the lethal injection for euthanasia, Reuters news service reports. The "Deliverance" program asks a patient hooked up to an intravenous drip line three questions to make sure the patient is aware of the consequences. The final question is, "If you press YES, you will cause a lethal injection to be given within 30 seconds and [you] will die. Do you wish to proceed? Yes/No." The software is expected to be used after July 1, when the world's most permissive euthanasia law takes effect in Australia's Northern Territory.

■ **Send contributions of offbeat news, lists and anecdotes to mbetts@cw.com.**

Does your desktop need a mouse waterbed? Waveco in Palmetto, Fla., offers gel-filled wrist rests that conform to the user's wrist and palm. The Waterbed for Your Wrists costs $19.75, and the Waterbed for Your Mouse costs $15.95. — *Patrick Dryden*

Digital Frontiers

Corporate trademark owners are cracking down on unauthorized use of logos and brand names on renegade World Wide Web sites.

The unofficial Lego WWW Server at legowww.homepages.com was shut down earlier this year. The Lego fan who had assembled a site about Lego building blocks got threatening letters from trademark attorneys representing Lego Systems in Enfield, Conn.

Meanwhile, a federal court in Washington state recently closed the pornographic "candyland.com" Web site on grounds that it tarnished Hasbro's trademark for the Candy Land board game, according to "Computer Law & Tax Report," a newsletter in New York.

Firms worried about trademark abuses can subscribe to MarkWatch, an Internet monitoring service from Datalytics in Chicago. The service costs $895 per year. — *Mitch Betts*

Beatles forever

Thirty years after their first hit record, the Beatles generate more Infoseek search requests on the Internet than any other band

1.	Beatles
2.	Pearl Jam
3.	Phish
4.	Grateful Dead
5.	U2
6.	Pink Floyd
7.	Rolling Stones
8.	Beastie Boys
9.	Dave Matthews Band
10.	Led Zeppelin

Source: Infoseek Corp., Santa Clara, Calif.

Pentium Pro servers coming for Win NT

By Bob Francis

It's going to be a hot summer for PC servers.

Compaq Computer Corp., Hewlett-Packard Co. and Digital Equipment Corp. are all planning four-way servers based on Intel Corp.'s Pentium Pro processor.

All the systems were designed as Windows NT application servers and will include clustering or fail-over options. Fail-over allows one server to act as backup should another experience problems. It is different from mirroring in that fail-over systems allow a second server to handle other functions; mirroring dedicates both servers to the same function.

"Those are the kinds of capabilities we're looking for in our servers as we move more applications to NT solutions," said J. Matthew Merrick, vice president at Merrick Publishing in Louisville, Ky.

Many of the systems appear technically similar, but users say they want PC servers that create little downtime. "A lot of the servers look similar, but we're going to be looking for a company with a very high degree of reliability," said an information systems manager at an insurance company in New York who requested anonymity.

HP, in Palo Alto, Calif., will be first out of the chute next week with a four-way NetServer, the LX, which will include a 166-MHz Pentium Pro processor. Shipments of the system may be delayed a week or two so a flaw in the Intel chip set can be fixed, according to Intel.

The chip set flaw caused boot failures because of a timing problem between the clock and voltage levels on the server motherboard. The systems should ship by July — about a week later than expected.

This week in COMPUTERWORLD

■ **Job pressures**
Does your job stress you out? See our QuickPoll on the topic.

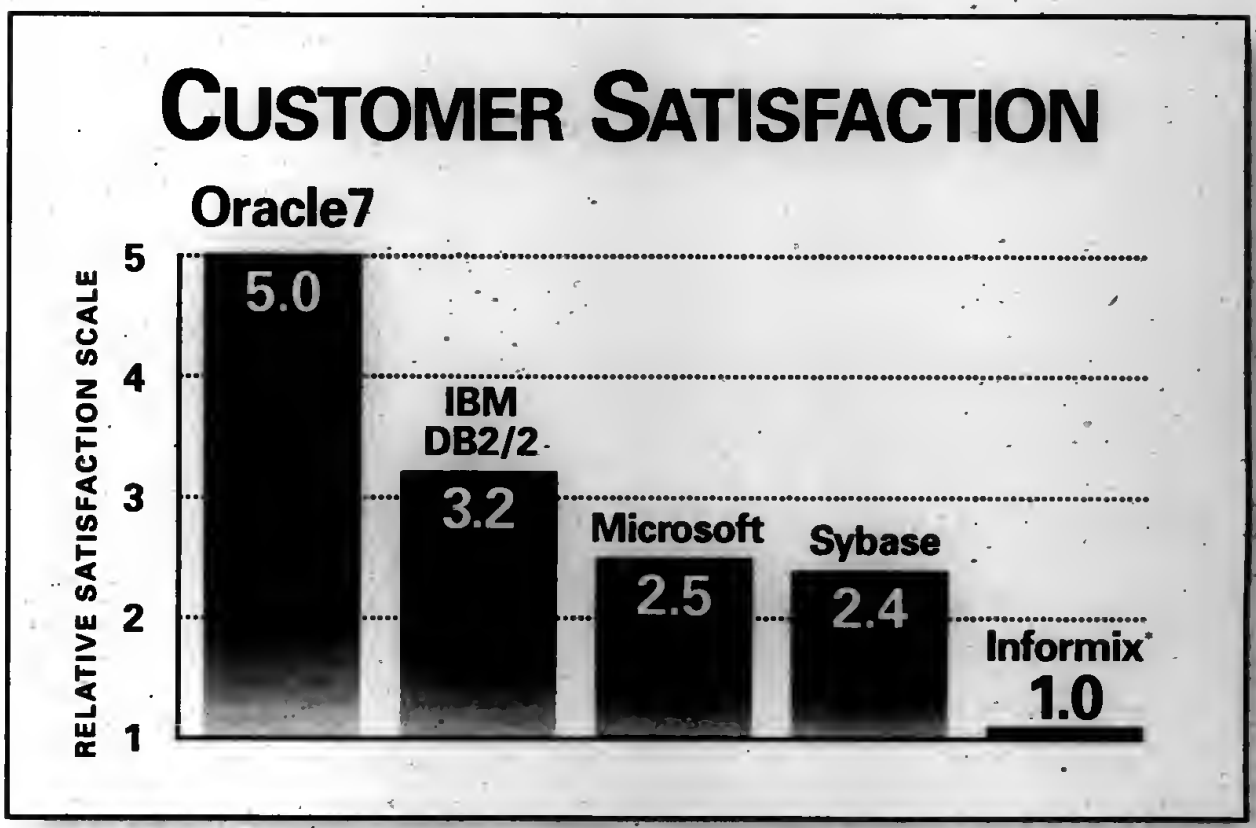
■ **Be happy in your world**
Do you want management to usurp your screen saver with reminders such as restating its policy on sexual harassment? Join *Computerworld* reporter Patrick Dryden in a forum on technology that takes the personal out of PC.

■ **Web money**
Despite the glitches and risks, companies are gearing up to do commerce on their Web sites. Check out our feature on electronic commerce.

www.computerworld.com

Can't Get No Satisfaction? Try Oracle7.

Computerworld asked database users to grade their satisfaction level. In comparison to Microsoft and Sybase users, twice as many Oracle users rated their satisfaction an "A," the highest grade allowed. And, as you would expect, five times as many Oracle users rated their satisfaction an "A" when compared to Informix's ranking.



The prestigious *Computerworld* Buyer's Satisfaction Scorecard concluded, "Oracle7.1 Enterprise Server is far ahead of the competition in...customer satisfaction..." A surveyed Oracle customer said, "In my 20 years of database experience [Oracle7] is by far the cleanest. It practically has no bugs."

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Computerworld survey results as of April 15, 1996. *Informix results based on smaller sampling due to lack of response.

Users find Access 95 crashes too common

By Laura DiDio

Despite a raft of new enhancements in Access 95, some users of Microsoft Corp.'s Access database are encountering memory leaks and regular systems crashes when they deploy the software.

Users, analysts and systems integrators also said Access needs more memory — at least 16M bytes — to run comfortably under Windows 95, not the 12M bytes that Microsoft recommends. Under Windows NT Workstation, Access also performs better and more reliably with 24M bytes of memory instead of the 16M bytes the vendor recommends.

User heavy

Microsoft's Access database currently has an installed base of 10 million users, said product manager Leslie Feller.

Interviews last week with about a dozen users and industry experts indicated the latest, enhanced 32-bit version of Access 95 for Windows 95 and Windows NT Workstation is still plagued by frequent systems crashes. The product began shipping six months ago.

Scott Rackliffe, vice president of information services at Farm Credit Financial Partners, Inc. in Agawam, Mass., said the bank has encountered memory leaks in the 32-bit Access 95 version. He said the leakage has led to systems freezes and crashes.

"It's been a major pain for us. Every time one of our users wants to run a report, we have to exit the application in order for Access to reallocate the memory and avoid a system crash," Rackliffe said.

Older programs always required a fixed amount of memory, and if it wasn't available, you simply couldn't run the application. Today's dynamic applications simply consume as much memory as they need from the operating system.

Hungry for memory

Problems occur when the application becomes a glutton and doesn't return the memory to the system once it has completed a task. The result: systems freezes and General Protection Faults that ultimately crash the system.

Leslie Feller, product manager for Access at Microsoft, said the company's technical support staff is working closely with Rackliffe and Farm Credit to fix the problem. "To my knowledge, this is the only report we have of memory leakage in Access 95," Feller said. "And there are no widespread bugs causing system crashes."

Access is a general-purpose database for desktop users, which has been shipping since November 1992. It is targeted at all levels of users and complements the company's higher-end SQL Server. To date, Microsoft has sold 10 million copies of Access, and usage has soared since the company bundled it into Office Professional.

Tips to maximize Access performance:

Make sure you have at least 16M bytes of memory; 24M bytes is preferable for Windows NT Workstation

Use the Performance Wizard Analyzer utility in Access 95

If your screen freezes or the system slows dramatically, you may have a memory leak. Add more memory.

Make sure you have the latest versions of adapters and software drivers

But it is no secret that Access got off to a bad start.

The initial version was "so bug-ridden that Microsoft practically had to give Access 2.0 away for free," said Mark Minasi, president of Tech-Teach International, Inc., a systems integrator in Arlington, Va.

Feller acknowledged the earlier snafus but said the vendor has optimized Access for 32-bit platforms and improved overall performance in the latest version.

But along with the advancements came problems; systems crashes topped the list.

Tom Lawson, an administrator at Digital Interface Technology in Australia, became frustrated after he experienced 300 Access systems crashes and sent 30 unanswered faxes to Microsoft Australia. So, last week, he started an informal survey on the CompuServe NT and Internet Usenet forums. Lawson asked members if they could run Access 95 on Windows NT Workstation using the 16M bytes of memory — without crashing.

Nearly all the dozen respondents said that without lots of RAM, "Access just doesn't work well." One user said, "As to your wish of getting through a day without an Access crash ... good luck."

Windows 95 problems could be the fault of the applications. See page 46.

Large Internet providers in talks to offer guaranteed response time

By Mitch Wagner

The nation's largest Internet service providers, including MCI Communications Corp. and Sprint Corp., are scrambling to bolster Internet reliability as they try to break up traffic jams on the overburdened network.

The goal is to guarantee minimum response times over much of the Internet through cooperative agreements among competing Internet service providers that serve the bulk of 'net users in the U.S. These deals are expected to unfold throughout the year.

Slow response

Sluggish response time is one of the biggest problems facing Internet commerce, fledgling online businesses say. Potential customers who can't get through to World Wide Web sites get disgusted and give up on using the 'net for commerce.

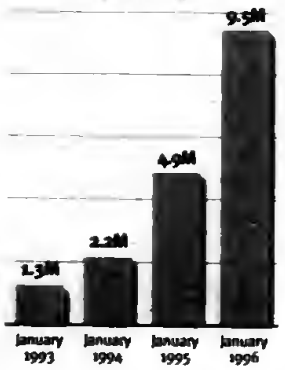
"If you picked up a phone and a lot of the time got a fast busy signal, you wouldn't use the phone for much of anything," said John Plocher, chief technical officer at BigBook, Inc., a San Francisco publisher of a business directory on the Web. "But instead, when you pick up a phone, you get a dial tone, and that means you take the phone for granted for business."

BBN Planet in Cambridge, Mass., is discussing with MCI, Sprint and PSINet, Inc. the possibility of guaranteeing levels of service. BBN plans to open discussions soon with UUnet Technologies, Inc., said John Curran, chief technical officer at the firm.

BBN hopes to be able to offer service guarantees among its customers and customers of those four other major providers — accounting for a bulk of the nation's Internet traffic — by year's end, Curran said.

Busting out all over

Number of servers attached to the Web



Source: Network Wizards, Menlo Park, Calif.

In separate discussions, ANS CO+RE, Inc., a subsidiary of America Online, Inc., is negotiating agreements with Sprint and MCI on directing Internet traffic among the three networks.

The companies hope the talks, which began nearly a year ago, will lead to guaranteed service agreements.

Internet experts agree that predictable performance across the Internet would greatly benefit everyone on the 'net. But they disagree on its feasibility.

Hurry up

Response times are especially important in audio and video applications, where unexpected delays of a few hundredths of a second can make a signal unintelligible.

"It's a great concept," said Alan Taffel, vice president of sales and marketing at UUnet. "The implementation is another matter. It will be very difficult to measure any kind of performance and even harder to enforce specific kinds of performance levels."

He cited the slow progress on the ANS CO+RE, Sprint and MCI agreements as evidence of the difficulty.

"That agreement was announced a year ago, and it's come to nothing," he said.

One of the most significant measures of response time on the Internet is "latency," which is the amount of time it takes for a signal to travel from one computer to another. Under good conditions, latencies on the Internet can be less than one-tenth of a second.

But conditions on the 'net often aren't good, and when they are especially bad, latencies can be measured in whole seconds or minutes. Even worse, sometimes signals don't get through at all.

Those sorts of finicky measures of time don't matter much when downloading the day's news headlines from Pathfinder.

Neatness counts

But videoconferencing, Internet telephony and real-time audio and video depend on precise latencies to deliver clear signals. And real-time applications over the 'net, such as manufacturing process control, would also require predictable latencies.

The launching point for performance agreements among Internet service providers are long-standing "peering agreements" already in place, by which the service providers route traffic among themselves.

Don Heath, president and CEO of the Internet Society, said performance guarantees by Internet service providers are inevitable.

Indeed, he said he expects response time to be the key differential among Internet service providers in the future. "The people that can deliver guaranteed responses will survive and flourish," he said.

U.S. easy target for cyberattacks

By Gary H. Anthes
WASHINGTON

The U.S. Congress looked at security in cyberspace last week and found it wanting.

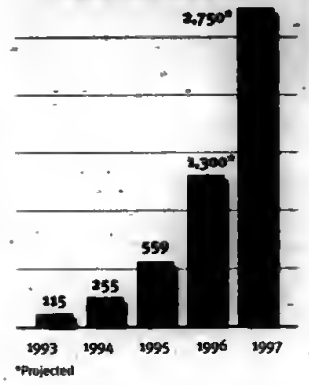
For example, federal investigators told a Senate hearing that U.S. Department of Defense computers were attacked some 250,000 times last year, with most of the assaults going undetected.

But the Senate hearing on "information warfare" raised more questions than it answered.

"Our government's traditional national security threats have been defined geographically," said Sen. Sam Nunn (D-Ga.), a military specialist. "But when we move from the physical world into cyberspace ... is the bad actor a 16-year-old, a foreign agent, an anarchist or a combination thereof?"

Regarding the Pentagon security breaches, the General Accounting Office declared, "At a minimum, these attacks are a multimillion-dollar nuisance; at worst, they are a serious threat to national security."

Computer attacks reported by U.S. Department of Defense installations



*Projected

Source: Defense Information Systems Agency, Arlington, Va.

"Attackers have seized control of entire defense systems, many of which support critical functions such as weapons systems research and development. Attackers have also stolen, modified and destroyed data and software," the GAO reported.

Nearly two-thirds of the attacks last year were successful — meaning the hacker penetrated the system — but less than 1% were detected and reported, the GAO said. The majority of the attacks were against systems carrying sensitive but unclassified information. Experts said commercial systems are at risk from terrorist attack as well. Particularly juicy targets include the information systems that support electronic fund transfers, air traffic control, power distribution and telecommunications.

"The power industry has its head in the sand; it has virtually no security at all," said Howard Frank, director of the Information Technology Office at the Defense Advanced Research Projects Agency.

Commercial enterprises have been slow to establish defenses against information warfare. Butler Lampson, a senior software architect at Microsoft Corp., said the handwringing by security professionals is "a waste of time. Nothing will get done until something really bad happens."

But the notion that nothing is being done is vigorously challenged by veteran Chief Information Officer Paul Strassmann. He said much effort is under way at the military's recently established Centers for Information Protection.

"In terms of attention at the highest government levels and the personnel dedicated to this task, current activity is exceeding my expectations, given the absence of a serious information attack on the U.S. military," Strassmann said. He is a member of the Information Warfare Defense Task Force of the Defense Science Board.

Economic espionage against the U.S. is on the rise. See page 72.

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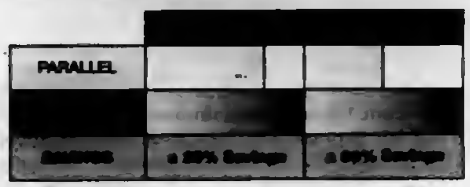

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Corel aims to be first to give Java a suite taste

By Lisa Picarille

Corel Corp. hopes to be the first major vendor to deliver an integrated applications suite based on Sun Microsystems, Inc.'s Java programming language.

At this week's JavaOne show in San Francisco, Corel plans to prove that Java is good for more than animations. Corel will demonstrate prototypes of Quattro Pro, WordPerfect and Corel Presentations that were written in Java, according to Eid Eid, Corel's vice president of software.

The platform-independent, native Java software will let users create documents that retain their original formatting and can be searched and viewed using a Java-based World Wide Web browser, such as Netscape Communications Corp.'s Navigator 2.01.

Battle of the suites

Suite	WordPerfect Suite 7		SmartSuite 96		Office for Windows 95 (Standard edition)
Applications included	■ WordPerfect 7 ■ QuattroPro 7 ■ Presentations 7 ■ CorelDraw ■ Sidekick ■ Envoy	■ AT&T WorldNet ■ CorelFlow 3 ■ DashBoard 95 ■ Desktop Application Director	■ WordPro 96 ■ 1-2-3 Release 5 ■ Freelance 96 ■ Approach 96	■ Organizer 2.1 ■ ScreenCam ■ Global Network Navigator	■ Word ■ Excel ■ PowerPoint ■ Explorer 2.0
Price	$395		$399		$499
Upgrade	$129		$149		$249

Wet their whistle

The Java suite will be available by year's end. But users can get a taste of Java sooner in the form of Corel's Barista.

The new publishing engine allows users of Corel's WordPerfect 7 and Ventura 7 packages — both due out by July — to automatically create Java documents without having to program in Java.

Jeff Silverstein, editor of "The Software Industry Bulletin" in Stamford, Conn., called Corel's goal too ambitious. He said Corel has too much on its plate, and it isn't clear that users really need Java-based applications.

Brian Peabody, director of end-user computing at Prime Consulting Group, a construction and equipment consulting firm in Norcross, Ga., said even though he runs a WordPerfect shop, he still isn't sure what benefits a Java version of WordPerfect offers.

Rival suites developer Microsoft Corp., which licensed Java from Sun in December, declined to comment on its product plans. At Lotus Development Corp., an official said, "We are exploring the potential for Java in our desktop applications."

In the short term, Ottawa-based Corel needs to battle Lotus and Microsoft in the market for Windows 95-based suites. This week, Corel plans to ship an updated version of PerfectOffice for Windows 95.

Now called Corel WordPerfect Suite 7, the suite adds several of Corel's best-selling applications (see chart). It also provides better integration of the core applications.

The suite, targeted at WordPerfect's installed base of 20 million users, also adds Internet support for importing and exporting Hypertext Markup Language files.

Corporate PC managers will now have to decide if they should upgrade their WordPerfect users to the Corel suite or follow the stampede to Microsoft's Office.

Even a beta tester for the Corel suite is unsure. Gary Wilkerson, an administrator at Kaiser Permanente Health Plan, Inc. in Atlanta, said his company is upgrading its 1,400 users to Windows 95 and considering a move to Office.

"We are asking ourselves [whether this is] the time to switch to Microsoft Office or not. The cost of switching may far exceed the cost of upgrading to the latest WordPerfect Suite. We are looking into it," he said.

Corel has less than a 10% share of the PC software suites market and wants to boost that to 20%. Lotus is in the same position.

"I look at Microsoft Office with close to 90% market share in 1995, and I don't see how Corel or Lotus can do it," said Chris Le Tocq, an analyst at Dataquest in San Jose, Calif.

Win 95 problems aren't always the fault of the operating system. See page 46.

News Shorts

Internet accounts extended beyond U.S.

Soon, road warriors traveling abroad from the U.S. will be able to take their Internet accounts with them. **UUnet Technologies, Inc.** last week launched a service that will allow users to dial up their accounts using local calls from Europe and Asia. Meanwhile, **Aimnet Corp.** in Santa Clara, Calif., has launched a consortium with nine Internet service providers in Asia and Australia to offer roaming service with functionality similar to UUnet's service.

HP adapts Odapter

Hewlett-Packard has introduced object-oriented middleware that dynamically links Java-enabled clients on intranets or the Internet to multiple corporate databases. The Depot/J package surrounds HP's existing Odapter software with Java support and point-and-click development tools. Users can combine business rules and fields from mainframe, Unix and flat-file databases into objects that are then built in to Java applets. Shipments start in late summer.

More PC price cuts

Two PC manufacturers dropped prices last week. **Hewlett-Packard Co.** in Palo Alto, Calif., cut prices on two server lines. Prices on the NetServer LS fell by as much as 27%. The NetServer LC line got price cuts of up to 17%. Server memory prices also fell by as much as 35%. Meanwhile, **Compaq Computer Corp.** in Houston cut prices on Pentium desktops by as much as 24%. A ProLinea E 5/100, with a 630M-byte hard disk and a 100-MHz Pentium processor, is now $1,299, down from $1,622. HP officials said they plan to match Compaq's desktop price cuts shortly.

Tax woes? Try ernie.ey.com

Looking for expert advice, but can't face yet another management consultant? **Ernst & Young LLP** is counting on it. The New York-based consulting firm last week launched a World Wide Web site that, for a $6,000 annual fee, offers users advice on everything from taxes to executive pay to technology buys. Customers contact Ernst & Young staff at ernie.ey.com and are guaranteed an electronic-mail answer within two business days.

Cabletron acquires ISDN firm

Switching hub vendor **Cabletron Systems, Inc.** last week firmed up its remote networking product line with the acquisition of Integrated Services Digital Network (ISDN) remote access firm Network Express, Inc. in a stock swap valued at $110 million. The acquisition helps Cabletron make up ground between itself and rivals Cisco Systems, Inc. and 3Com Corp.

CA revenue up; stock drops

Computer Associates International, Inc. reported 38% revenue growth and 25% net income growth for its fourth quarter ended March 31. Revenue for the fiscal year exceeded $3.5 billion, which solidified CA's position as the second-largest independent software vendor behind Microsoft Corp. Still, CA's stock fell more than $5 to close at $76 on the New York Stock Exchange. This occurred after CA President Sanjay Kumar told analysts that the current quarter would provide a "tough comparison" with last year's quarter because of high amortization charges related to CA's $1.8 billion acquisition of Legent Corp. in 1995.

SHORT TAKES **Microsoft** last week announced it is offering training on the Internet for managing Windows NT and Windows 95 software; prices range from $200 to $900. ... **Open Market, Inc.**, a 2-year-old World Wide Web server maker in Cambridge, Mass., made an initial public offering of 4 million shares of stock last week at $18 each. ... Robert S. McKinney, former chief information officer at PaineWebber, Inc., has been named vice president and CIO at **Tenneco** in Greenwich, Conn. ... **Netscape Communications Corp.** posted to its Web site an updated beta-test version of its Navigator 3.0 browser that, among other things, fixes a Java-related bug. The new version is Navigator 3.0 Beta 4. ... **AT&T Paradyne** last week announced a cellular data protocol that will enable 1-second connection times for mobile users making cellular data transfer calls. That is an 88% to 93% decrease in the current 8- to 15-second connection times offered by competing technologies. Called ETC2 Quick Connect, the protocol offers higher throughput and improved reliability over V.34 modulation.

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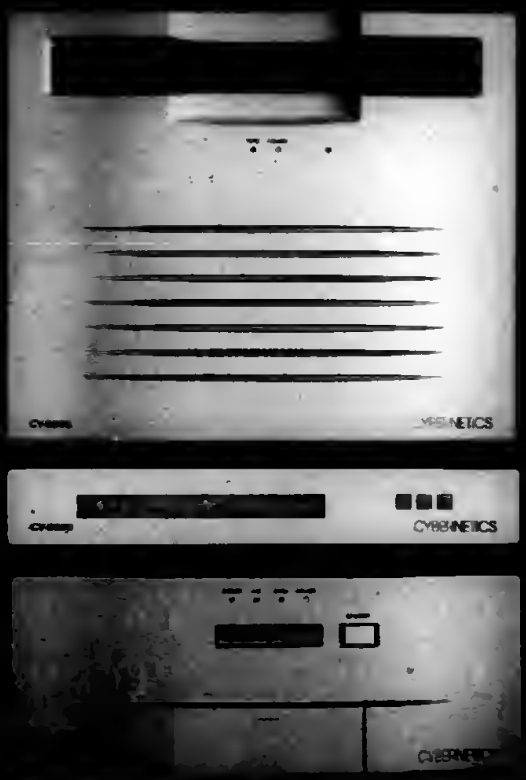

The fastest half-inch tape drive on the market

Rack mount and library configurations available

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The CY-9000 half-inch digital DTF drive is a breakthrough in performance that slashes backup and restore time while providing unsurpassed reliability and data integrity.

No other tape drive can match it.

I/T Technology	Transfer Rate (Native)**	Tape Capacity (Native)**
CY-9000 DTF	12 MBS	42 GB
3590	9 MBS	10 GB
VHS	8 MBS	27.5 GB
3490	3 MBS	800 MB
DLT 4000	1.5 MBS	20 GB

* *Sentry Market Research*
** *All drives, except VHS, are available with data compression*

The cost of system time varies from site to site, but a recent study has put the cost of a medium sized PC LAN at ***$18,000 per hour*** — and the cost of a UNIX network at ***$30,000 per hour***.* Numbers like that make it easy to understand how a backup/restore solution that can do its job faster can save you serious money.

For example, for a single 40 GB restore, the CY-9000 will save you...

$9,000 over 3590,
$13,500 over VHS,
$83,100 over 3490, and
$194,100 over DLT.

And you won't need to change tapes...

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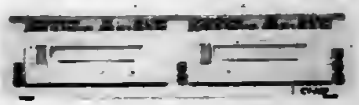
2 times with DLT, and
50 times with 3490.

The CY-9000 can store 42 GB uncompressed on a single tape, at 12 MB per second. Optional data compression can boost tape capacity to up to 210 GB per tape and speed to 20 MB per second — for the fastest backup in its price range.

Based on field-proven helical scan recording technology, the drive is available with Fast/Wide SCSI, ESCON, IBM Channel, and Parallel Data Channel interfaces for plug compatibility with the widest range of computer systems. A 32 MB data buffer speeds throughput, and you can add up to an additional 128 MB of *variable rate buffer* to handle the most demanding data collection applications.



The Advanced SCSI Processor lets you cascade more than eight tape drives to work together in striping, mirroring, cascade, multiplexed, and offline copy modes.

If you're a leading company confronting a shrinking backup window or if you're a growing company wanting to boost productivity and save resources, the CY-9000 is probably right for you. We'll also be glad to talk to you about our high performance 8mm tape and optical disk solutions.

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AT&T Internet service strains to meet user demand

By Kim Girard and Juan Carlos Perez

AT&T WorldNet, a powerful new player in the Internet service provider market, is struggling to meet the demands of the 150,000 customers it has drawn in just the past nine weeks.

Last week, the telecommunications giant declared itself second only to NetCom Online Communications, Inc. in the competitive Internet provider market. So far, AT&T has received 600,000 requests for service but has shipped setup software to only 300,000 people — half of whom opted to sign up. NetCom boasts about 400,000 subscribers.

Reacting to AT&T's strong showing, analysts said they expect more telecommunications companies to acquire smaller regional Internet providers. Also likely is an Internet service provider push for more business customers and, of course, continuing price wars. In the long term, users can expect a battle among the leading online services and the bigger providers as they start offering content to subscribers.

Ten percent of WorldNet subscribers are business accounts, but the percentage should double by 1997, said Greg Cline, an analyst at Business Research Group in Newton, Mass. NetCom has a 20% business subscriber base, he said.

'net access

Though most businesses now go online through smaller, regional service providers, AT&T hasn't even begun to target that market, Cline said. "This is an intriguing scenario."

Staying afloat

The flood of calls to AT&T WorldNet started Feb. 27 when the company offered its 80 million customers five free hours per month for a year of Internet access. In March, the wait for software was about five weeks. Now, it is about three weeks.

At a press conference last week, WorldNet Vice President Thomas Evslin acknowledged that the start-up was unprepared for the huge response. Adding help-line staff members and making improvements to the Internet access network should help iron out problems, he said.

On the downside, AT&T has just 200 Internet locations where users can access service for the cost of a local telephone call. This means more customers have to pay a long-distance charge for access. PSINet, Inc. has about 250 access points, and CompuServe, Inc. has about 600.

Despite the early problems, John Robb, an analyst at Forrester Research, Inc. in Cambridge, Mass., said AT&T is well-positioned to lock in customers.

"Once the software is installed and the Internet service is hooked up, it's hard to change [providers]," he said.

Fearing AT&T's squeeze, the smaller providers will need to cut pricing and improve service, he said.

MCI Communications Corp. announced it will match AT&T's WorldNet pricing of $19.95 for unlimited monthly use. AT&T customers can choose between five free hours per month and $2.50 for each additional hour or the $19.95 unlimited plan, which is competitive with other access providers.

However, analysts say MCI, the first long-distance company to hit the Internet in 1994, has been fumbling the ball. For one, the company is offering Microsoft Corp.'s browser instead of Netscape Communication Corp.'s Navigator, the market dominator that AT&T will ship mid-June.

Sprint Corp. is expected to launch a consumer service similar to AT&T's this summer. But the battle for the Internet has only begun, said MCI corporate spokesman Alan Clark.

"The market is only 10% penetrated," he said. "For the wider scope, all of us have just scratched the surface here."

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Help for NotesView

Lotus management software to get scalability boost

By Tim Ouellette

Large sites want Notes management software to scale better.

Lotus Development Corp. is working to make that happen. A Unix-based version of NotesView's management console — a graphical tool that centralizes the administration of far-flung Notes servers — is due by year's end. And Version 4.0, which supports Windows NT and Windows 95 workstations, is coming out next month. That should help resolve some of the scalability issues, a Lotus manager said.

"NotesView didn't bring the value we were looking for," said David Torrentino, a consultant for infrastructure applications at Johnson & Johnson Co. in New Brunswick, N.J. "In general, there is a real shortage of good management tools for Notes," he added.

On the hot seat

Lotus recently took some heat at a meeting with major Notes users, industry sources said.

In addition to the new versions of NotesView, the Cambridge, Mass.-based vendor is also rumored to be considering buying or licensing network and replication management technology from third-party developers, but Lotus officials wouldn't comment.

Any perceived lack of scalability for the tools to manage large Notes networks could be a blow to the efforts of Lotus and its parent company, IBM, to make Notes 4.0 groupware a player at the enterprise level.

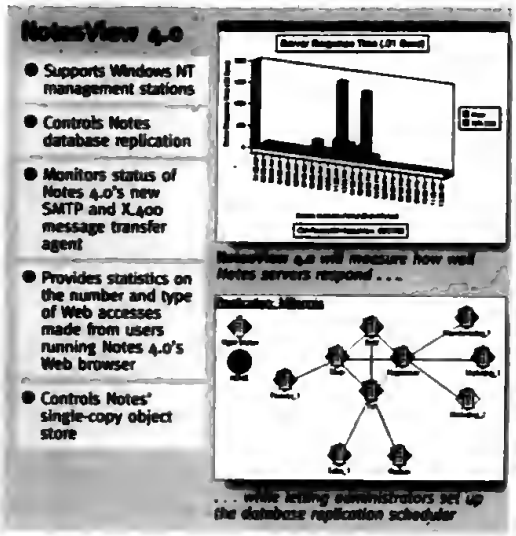
NotesView requires that users run Hewlett-Packard Co.'s OpenView for Windows Workgroup Node Manager. But the Windows workstation can manage only 10 servers in the workgroup edition and up to 150 servers in the enterprise edition. Large Notes networks often have hundreds of Notes servers.

Support for IBM's SystemView management software on AIX will come later this year.

Some customers said they are looking forward to the AIX version. "If NotesView was Unix-based, it would be a good tool for a help desk," said Mike Libretti, a Notes administrator at a large consumer products manufacturer in the Northeast.

But some Notes users have turned to third-party applications to bolster NotesView. These include CleverWatch from CleverSoft, Inc. in Scarborough, Maine, for automated monitoring, or DYS Analyzer from DYS Analytics in Newton, Mass., to improve replication performance.

Morgan Stanley & Co. in New York uses CleverWatch alongside NotesView. "The combination of both is real strong," said Notes engineer Ramon Conde.


NotesView 4.0
Supports Windows NT management stations
Controls Notes database replication
Monitors status of Notes 4.0's new SMTP and X.400 message transfer agent
Provides statistics on the number and type of Web accesses made from users running Notes 4.0's Web browser
Controls Notes' single-copy object store
NotesView 4.0 will measure how well Notes servers respond . . .
. . . while letting administrators set up the database replication scheduler

Development tools bow for Notes. See page 52.

SMP for OS/2 Warp Server to take flight

Software beefs up processing power

By Laura DiDio

IBM, anxious to jump-start its OS/2 Warp Server software, will announce long-awaited symmetrical multiprocessing (SMP) capabilities for the product at Comdex/Spring '96 in Chicago next week.

IBM's basic four-way SMP support for the OS/2 Warp Server beta software is being sent to select users now. The production version is slated to ship in the third quarter, sources close to the company told *Computerworld*.

Symetrical multiprocessing

An IBM spokesman confirmed that the company was set to begin shipping beta versions of the SMP software but declined further comment.

SMP will give users the ability to inexpensively add power to existing servers by off-loading network tasks across several processors. This obviates the need for new servers and cuts down on administrative tasks. For end osers, SMP "turbocharges network throughput," said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston.

SMP for OS/2 Warp Server will eventually be bundled with the core network operating system. But current OS/2 Warp users will receive a free software upgrade that supports up to four processors, sources said.

Longtime OS/2 user Ray Pratts, a senior technical analyst at Variable Annuity Life Insurance Co. in Houston, said SMP support for OS/2 Warp Server is vital, especially in large corporate environments.

"SMP would let us attach more clients to each server. That makes for more efficient and quicker network management," Pratts explained. "Trying to keep our servers in sync is a nightmare, and it takes us months to update them all. SMP would really reduce my workload."

Additionally, he noted, Variable's end users would benefit from the beefed-up processing power.

Can it stop NT Server?

But whether IBM can use an increasingly robust OS/2 Warp Server to mount a serious competitive challenge against Microsoft Corp.'s Windows NT Server is still unclear, said Jon Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass.

"Warp Server's new and improved technology offers more bang for the buck than NT Server, but that won't change market realities," Oltsik said. "NT is on a roll. And faced with a lack of applications, even large OS/2 Warp Server sites are actively planning to migrate to NT Server."

Even stalwart IBM user Pratts expressed concern about IBM's ability to market OS/2 Warp Server. "Deep down I'm afraid we'll end up like a jilted lover," he said.

Bank error in your favor. Collect $924,844,208.32

By Melissa Bane

Who says you can't get something for nothing?

Some of First National Bank of Chicago's customers got just that and more when they telephoned in to hear their checking account balances on May 17. A software glitch in the bank's system dumped $924.8 million into each of the 826 checking accounts affected.

Big bucks

The generous software error, worth $763.9 billion, rang up at 6½ times First Chicago's actual worth. The bank's assets total $115.5 billion.

First Chicago officials wouldn't discuss details of the software problem, saying only that it was a "programming error."

"I had people telling me left and right to wire it down to the Caymans, take it and run," said Jeff Ferrera, one of the First Chicago customers affected by the error.

Ferrera, a computer network technician at Zenith Electronics in the Chicago suburb of Glenview, even considered wiring the money to a stockbroker in Miami to try to collect interest on the mistake. Realizing the bank would probably not let him keep the money, he recorded the message on his home telephone answering machine for posterity.

"Your primary checking account currently has a book balance of $924,844,208.32," recited the First Chicago electronic message system.

Ferrera noticed the problem on Friday, but customers had been reporting it since Thursday. By Saturday, the bank had frozen all of the excess cash in each account. Ferrera added that this kind of glitch would not keep him from using the bank.

"They can give me all the money they want; I don't have a problem with that," Ferrera said. "As long as they don't take my money or take anything."

That's just what happened at Chemical Bank two years ago when a programming error deleted half the balance of thousands of checking accounts.

"Something like that can be damaging to a bank," said Bob Landry, an analyst at The Tower Group, a financial services consultancy in Wellesley, Mass. Landry added that using various systems to update bank accounts — including automated teller machines, telephone-banking systems, PC-banking systems and human tellers — increases the chances for errors.

"Moving forward, banks are trying to have just a single balance that all the delivery systems use," Landry said. "That way, balance changes are easier to monitor."

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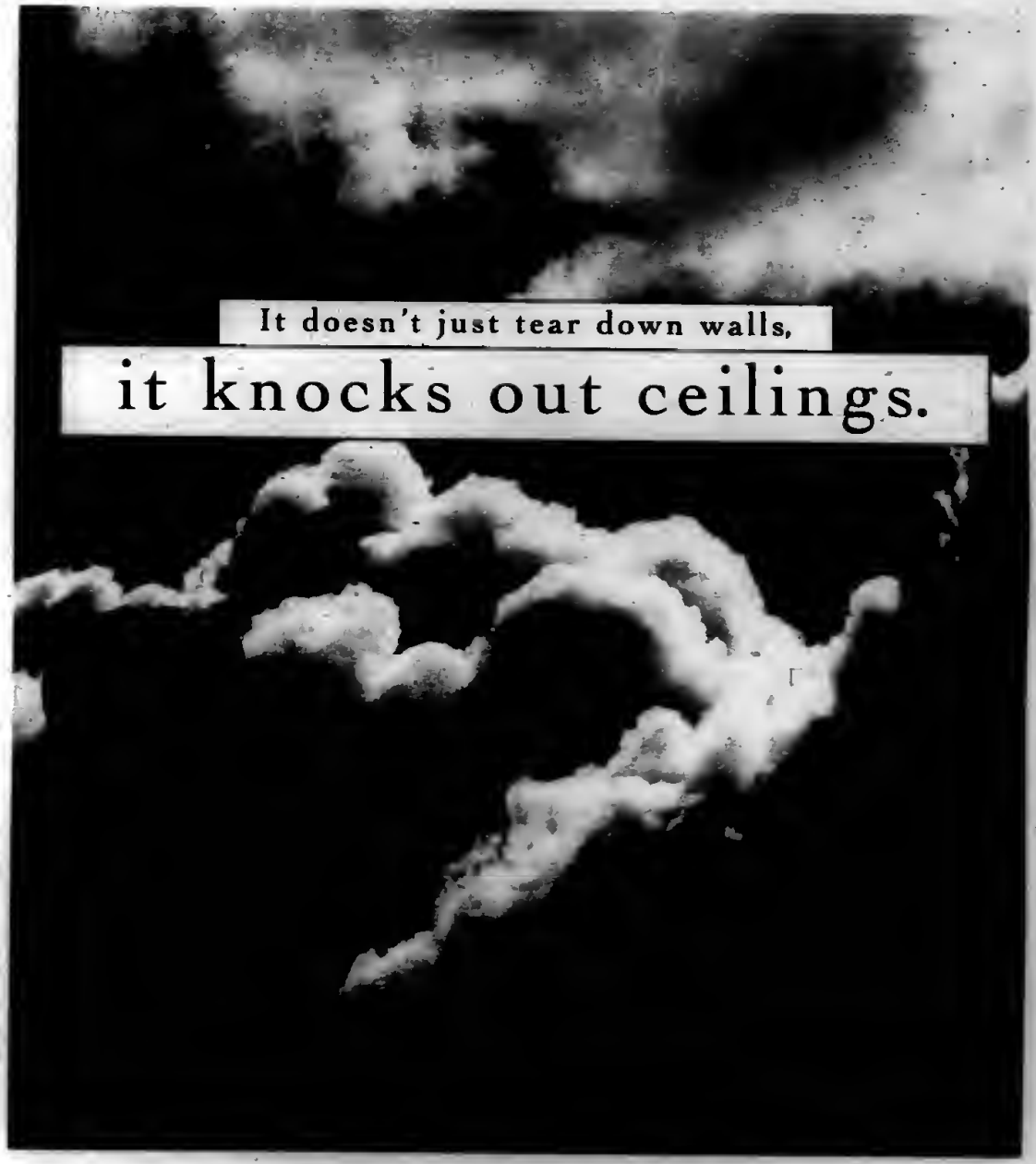

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Visual Basic

CONTINUED FROM PAGE 1

"The 16-bit VB 4.0 is not acceptable," said Chris Kwiecinski, senior systems developer at Nabisco, Inc. in Parsippany, N.J. The development environment "does not run at a decent pace, and once you get your application done, it just runs very slowly. It's very resource-intensive, and it really doesn't buy you all that much."

"We've gotten burned with VB so many times that we've stopped recommending that people go to it," said Bob LeRoy, director of Cincinnati-based Advanced Technology Group at Cap Gemini America. "It's very slow [in general]. You can't use the controls that come with it — you have to go out and buy third-party controls."

Bankers Trust's Joe Schwartz *says he accepts VB's 32-bit environment for what it is*

As a result, some developers use VB 4.0 only for new Windows 95 or Windows NT applications.

"We've consciously made a decision not to rewrite our old Version 3 applications. It's not worth the investment to us," said Richard DiBiasio, a software development manager at Fidelity Investment Co. in Boston. "You've got to ask, does it make money-sense to spend a whole lot of effort trying to port these applications unless there's some mission-critical reason?"

Other products could be substituted, but it would be even more costly to migrate, for example, to PowerBuilder, a product from Sybase, Inc.'s Powersoft Corp. subsidiary in Concord, Mass.

"I can't think of anything I've converted over from VB 3," said Steve Plechka, a technical division specialist at Nike, Inc. in Beaverton, Ore. "There's a lot of overhead on 3.1 with all the OLE libraries that are required for VB 4.0."

Those OLE libraries mean large VB 3.x applications that require 12M to 16M bytes of memory need even more resources with VB 4.0 under Windows 3.1. Changes in language syntax and storage structures have caused glitches when VB applications must communicate with non-VB-based systems, users said.

"That's interesting. I hadn't heard that," said Christopher Flores, Visual Basic product manager. "We haven't had a lot of people complaining about the transition."

Dave Sarna, who heads up the VB Large Users Group in New York and New Jersey, said a lot of people are complaining about VB. Sarna is chairman of ObjectSoft in Hackensack, N.J.

But not all VB 4.0 users have major complaints. "There are some gotchas, but no showstoppers," said Joe Schwartz, a senior consulting systems engineer at Bankers Trust New York Corp. in New York. "It's the price you pay when you move from 16-bit to a 32-bit environment."

"I think it's terrific, but it's a very ambitious product with a lot of teething pains. Porting is no easy feat," said Dave Lindgren, director of advanced development at the DunsGate division of The Dun & Bradstreet Corp. in New York. "It's the first environment that makes doing OLE and object-oriented [development] easy."

Digital server lets data streams refresh desktop

By Michael Goldberg

Digital Equipment Corp. this week will unveil a multimedia server that lets users drop video and audio clips into popular desktop applications such as Microsoft Office.

Based on a workgroup or departmental AlphaServer running Digital Unix, the Mediaplex Network Server includes software to "turn on" multimedia applications in client software residing on PCs.

But the PCs must run Windows 95, and they require special software to receive multimedia data streams over Ethernet or Fiber Distributed Data Interface LAN connections. Prices start at $46,000 for a 40-user system.

Growth path

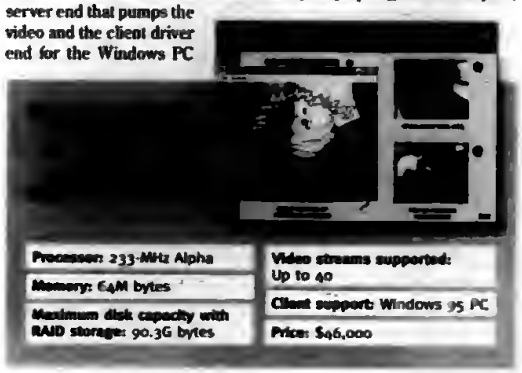
Users and analysts described the relatively easy client access to multimedia as an important advance in a nascent-but-growing video server market for applications such as in-house corporate communications and employee training.

The U.S. video server market is expected to reach $140 million this year, up from $95 million in 1995. The market should hit $1.7 billion by 2000, according to the Business Research Group in Newton, Mass.

Early test users of the technology said Digital is making video clips more accessible.

Carnegie Mellon University researchers will probably use Mediaplex as part of their video clip search engine for tape and film archives. The university is finalizing a deal with Digital.

Digital has supplied both the server end that pumps the video and the client driver end for the Windows PC boxes, said Craig Marcus, project manager at Carnegie Mellon's Informedia Project. This "makes it easy" to drop in a video clip, Marcus said.


Processor: 233-MHz Alpha
Memory: 64M bytes
Maximum disk capacity with RAID storage: 90.3G bytes
Video streams supported: Up to 40
Client support: Windows 95 PC
Price: $46,000

Aid for commercials

In New York, Joseph D'Alessandro, a 40-year veteran of the television commercial production business, said Mediaplex technology will trim the need for ad agencies to have so many messengers, researchers and warehouse-like tape vaults.

D'Alessandro, a principal at Video Retrieval Systems, Inc., said that instead of a fast-food chain having to reshoot the grilling of a hamburger for each commercial, it could reuse its archive of digitally recorded images.

Users don't need the services of a consultant or systems integrator to deploy Digital's Mediaplex; this is a different approach from that offered by video server rivals, said Enrique Godreau, an analyst at Gartner Group, Inc. in Seattle.

Market leader Hewlett-Packard Co. has joined Starlight Networks to provide video server products to corporate users, and the MediaCenter server from Sun Microsystems, Inc. was designed to be an application development platform, Godreau said.

"The real advantage is the ability to have out-of-the-box connectivity" to desktop applications, he said.

Texas installs a video network. See page 57.

VBA

CONTINUED FROM PAGE 1

the process, Microsoft hopes to knock out Sun's moves to position Java as the heavyweight in that arena.

In addition, industry observers said moving VBA into the application domain will spread its usage from the huge installed base it has now to power users and users who want to customize off-the-shelf applications.

Industry sources said about 100 vendors are expected to sign on with Microsoft's licensing move.

Until now, VBA has been used only in Microsoft Office.

The licensing will allow vendors to get the Visual Basic scripting language directly from Microsoft instead of going through third-party vendors that offer Visual Basic clones.

"It sounds like a great idea. You are a lot better off if you have a common macro programming language, and the farther it extends, the better you are," said John Tredennick, partner and chief information officer at Holland & Hart LLP in Denver.

The law firm is standardized on Microsoft Office.

In other news

In a related announcement this past March, Microsoft said it would create a subset of Visual Basic, called VB Script, that will serve as a scripting language for its Internet Explorer World Wide Web browser.

Scripting languages

VB Script, which is scheduled to ship by the end of June, will be available for free and will let Web pages include components based on Microsoft's ActiveX architecture as well as on Sun's Java.

"People have been asking Microsoft to license [VBA] for the past several years," said a source close to the company.

"They're moving now because of Java. Java has a toehold, and they want to solidify Visual Basic as the de facto standard before Java has a chance to gain a foothold.

"Will it stop Java? Probably not. Will it increase Visual Basic's penetration? Absolutely. This move will be very successful for them," the source added.

Microsoft may be joining the game, but it is missing the ball, according to George Paolini, a spokesman for Sun's JavaSoft division in Mountain View, Calif.

"If they're retrofitting a desktop-oriented technology to the Internet, that's the wrong approach," he said.

"The right approach is to start from the ground up with the standard protocols of the Internet," Paolini added.

Dave Sarna, chairman of ObjectSoft in Hackensack, N.J., wouldn't say if he is negotiating to license VBA, but he said he is interested.

"There are several similar things on the market. And from a developer's point of view, it's safer to use Microsoft than something that's supposed to be compatible with Microsoft. Competing products will always be playing catch-up," Sarna said.

Solution to this week's crossword puzzle

3Com pulls faulty switches

CONTINUED FROM PAGE 1

affects all 2500s that have a single power supply.

3Com blamed the problem on "a connector manufacturer that did not meet their published specifications" for the 25-cent part. A typical configuration of the popular data switch in question costs about $15,890.

3Com in Santa Clara, Calif., wouldn't say how many users were affected or disclose how much revenue the 2500 generates.

3Com replacement program

SWITCH: LANplex 2500 with single power supply

PROBLEM: A corrosive buildup on a connection between the power supply and the switch's backplane can cut off system power

FIX: 3Com is replacing thousands of 2500s, and the problem has been fixed on all new units shipping

STATUS: 3Com is 70% through its switch-replacement program

FOR ADDITIONAL INFORMATION: Call the LANplex 2500 Advance Replacement Desk at (508) 264-1699

One user caught the problem while testing LANplex 2500s for a major opgrade of its 2,500-node network.

"We noticed a high failure rate with the 2500s, which is about when 3Com came to us and explained they had identified the problem," said Rob Walsh, a network manager at Nova Gas Transmissioo Ltd. in Calgary, Alberta. "We immediately started replacing the switches in a time frame that didn't actually impede our network upgrade."

The LANplex 2500 is used in data centers to break up bandwidth bottlenecks in backbone networks. It is also used in departments and workgroups to provide dedicated and switched capacity to individual desktops.

A surprising defect

Industry analysts were surprised to hear about the switch defect.

"3Com has a reputation for high-quality products, and since the 2500 is a very strategic-switch for them, it's very ugly that it comes out looking bad," said John Morency, a principal at The Registry, Inc., a Newton, Mass., consultancy that tracks the networking industry.

But Morency gave 3Com credit for replacing the switches now rather than waiting for numerous systems to fail.

But some users weren't as fortunate as Walsh.

One user who requested anonymity said his LANplex 2500 switches failed and took down his company's data network for several hours.

Other longtime 3Com users were thankful they bought dual-power supplies.

"We're aware of the problem but aren't affected since we buy all switches with dual-power supplies," said Virgil Palmer, manager of telecommunications, engineering and research at Air Products and Chemicals, Inc. in Trexlertown, Pa.

"We have to do everything we can to cover ourselves network-wise. We can't let a power failure in a switch with one power supply impact our network," Palmer said. Air Products uses more than a dozen LANplex 2500 switches.

Morency warned that users will see more problems in general in software and hardware as vendors truncate product testing cycles and reduce costs to keep pace with plummeting product prices.

"This scenario makes the industry ripe for more and bigger disasters," Morency said. "[Information systems] managers should wait six to nine months before bringing in new products. Otherwise, users will become part of vendors' testing processes whether they like it or not."

Morency predicted that the financial impact of the replacement program on the $2 billion-plus company will be minimal. "Given their proactive approach to the program, I think the damage will be fairly limited," he said.

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Interactive Web games to further tax networks

Network administrators prepare to do battle with workers

By Patrick Dryden

Batten down the Internet hatches and all usage policies on deck: Interactive Web games coming this summer promise another diversion that can swamp network resources and wash employee productivity overboard.

Browsers that operate at modem speeds will be able to support interactive action games among multiple players across the World Wide Web.

A slew of services will host such games, made possible by various advances that overcome the Internet's latency problems.

For example, Mpath Interactive in Cupertino, Calif., will launch the Mplayer game service next month. The service is targeted at deep-pocketed adult players, not teens and students.

Mplayer is based on a multiclient application protocol and a fully distributed network of game servers on the PSINet backbone.

Mplayer subscribers *can choose sides in interactive games such as 'Command & Conquer'*

Subscribers can choose sides in interactive strategy games such as the bestseller "Command & Conquer," then do battle and even taunt opponents and cheer teammates while they play.

Keep an eye on it

"That sounds cool — another Web potential for non-work-related activities," said Tom Anderson, network administrator at a manufacturing site for Amoco Corp. "We'll have to stay on top of these new game sites through central monitoring and reporting."

And managers will have to remind workers of company policy that prohibits activity that doesn't pertain to business, Anderson said.

Such highly attractive — and potentially addictive — games join other distractions that are accessible from desktops during work hours.

"Users can tie up gateways by playing games over the Internet like they do browsing Web sites and downloading files, whether [the files] are pictures of starlets or star clusters," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif.

Many organizations have discovered that users quickly usurp available bandwidth, forcing costly upgrades to feed Internet access demand, Howard said.

Ben & Jerry's flavors Web site with speedy animation

By Stewart Deck

Joe Wilkins decided it was time to add some exotic technical flavors to Ben & Jerry's home page. The Vermont ice cream maker's site visually was a single scoop of vanilla.

"We want a completely interactive page with an animated tour guide leading visitors around and answering their questions," said Wilkins, Ben & Jerry's Homemade, Inc.'s World Wide Web page director. But that kind of interactive animation can take several minutes to download over normal telephone lines, by which time most visitors have lost interest and are long gone.

Wilkins turned to Narrative Communications Corp. in Waltham, Mass., with his technical wish list. Narrative responded with its Enliven product suite, which lets users rapidly deliver large volumes of multimedia content over existing phone lines and modems.

At the core of the suite is software that works with a Web server to deliver animation streams to multimedia computers. It divides scenes into multiple object pieces, compresses each piece and delivers them to the desktop in an ordered animation stream. The software requires Windows NT and a Web server.

Fast and efficient

"This is a new approach to compression," said Dick Shaffer, principal analyst at Technologic Partners in New York.

"Narrative has taken a process that was painfully slow and made it much more efficient. This is a great product," he said.

Living Books, a San Francisco-based publisher of CD-ROMs for children, has been hesitant to do much with its titles on the Internet because it didn't want visitors to have a slow, dull experience, said Jeff Schon, president and CEO of Living Books.

The company will use Enliven to distribute samples of its titles over the Internet and explore the possibilities of subscriptions and pay-per-view.

"This technology lets us engage visitors and take advantage of existing phone and modem technology," Schon said. "It opens up some very interesting marketing possibilities for us."

The Enliven suite has three components: a client-side Netscape Communications Corp. plug-in viewer, a post-production tool for importing existing digital content from multimedia development products, and the server software. Pricing will be available by midsummer.

A video network sends classes to remote schools. See page 57.

Smokin' modems

CONTINUED FROM PAGE 1

PCMCIA group, a nonprofit trade association in San Jose, Calif., which sets standards for PC cards.

"Heat affects the notebook as well as the components. It's an issue for the industry, period — not just PC card makers," Lempesis said. "The notebook can be the toaster and the PC card, the bread."

Frustrated users

But two of U.S. Robotics' large customer sites, which between them have more than 500 of the PC cards, said they are losing patience with the vendor. The customers, who requested anonymity, said the overheated cards cause their laptops to shut down.

"We've just about had it with U.S. Robotics," said a network manager at a large utility in the Southeast. "We've had problems with about 400 Courier modems since last November, and they *still* haven't solved the problem. It's been extremely frustrating for us."

Product problems

Another longtime U.S. Robotics account experienced the same overheating problem with the Skokie, Ill., vendor's Sportster PC modems. "We've told them we don't intend to buy any more of their products until they get these PC card modem problems solved," said an information systems vice president at a firm in the Northeast, who also requested anonymity.

Bob Rainone, director of product management at U.S. Robotics' network systems division, characterized the user complaints as sporadic.

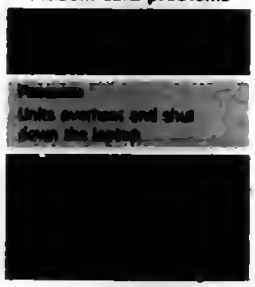
"We've been replacing the units for three or four weeks now," he said. Rainone declined to say how many customers have reported the overheating problem. "If we thought this was a huge issue, we would've done a recall," he said.

Both lines have been shipping since the middle of last year. Rainone pointed out that part of the problem is that the latest notebook computers run hotter than their predecessors. But he claimed that U.S. Robotics' replacement model was designed to take this into account.

Too hot to handle

Andy Prophet, president of AP Research in Cupertino, Calif., agreed that laptop design can lead to heat problems for PC cards. "Sometimes the notebooks are built in such a way that the card slots are too close to some hot

U.S. Robotics' PC modem card problems



spots and are not ventilated adequately," Prophet explained. "They are often located in a place that is not easily ventilated."

The analyst said the PCMCIA group last year approved a PC card specification that provides an option to "power down," thereby lowering heat and saving power. Products with this capability should be available by year's end.

He said heat problems "can occur with all PC cards, not just those made by U.S. Robotics."

Lempesis said although he has heard of no particular problems with specific PC card makers, the group has a thermal committee addressing heat issues. "The major notebook makers and PC card makers have to work together on this," he added.

IBM switches ease bottlenecks

IBM shops will soon have more flexible options for breaking up network bandwidth bottlenecks thanks to new Fast Ethernet products the company plans to announce this week.

Sources close to IBM said the company will announce three models of a stackable Fast Ethernet switch and a new model of its Ethernet switch.

Ports of call

The 8235 Fast Ethernet Stackable Hub will have 13 ports — five more than its predecessor — and will be available in September in three managed models. They will range in price from $2,895 to $4,495.

The new model can be equipped with three different Fast Ethernet uplinks and can be stacked six units high.

IBM will also roll out a two-port Ethernet and a two-port Token Ring remote access server.

— Bob Wallace

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Netscape leads subscription drive

By Tim Ouellette

Users may soon be subscribing to Microsoft's Office 95 in the same way they subscribe to this publication.

They will if vendors follow the lead of companies such as Netscape Communications Corp. and offer subscription-based pricing models and electronic distribution.

Such plans give users flexibility in downloading software products and upgrades from the World Wide Web, according to a recent report by Wessels, Arnold & Henderson.

"The key is, can companies distribute software in a way that is not disruptive to the client," said Peter Schleider, an analyst at the Minneapolis brokerage. Then "users themselves can determine when to upgrade," he said.

"We spend an incredible amount of time just maintaining what we have after a major upgrade," said Ron Murphy, vice president of information systems at CNL Group, Inc., a real estate firm in Orlando, Fla. He said he would be interested in a subscription plan if the software pieces stayed compatible and he could mix and match the components.

Spurred by the popularity of the Internet and Sun Microsystems, Inc.'s Java programming language, software developers will look more like publishing firms. They will constantly provide output to users instead of sending out bulky, convoluted upgrades every year or two, the report said.

Subscription deals

Subscription pricing vs. traditional pricing

Subscription	Traditional
Pay one price for specific time frame	Pay for product, then for upgrades
Download upgrades at your leisure	Receive upgrades when vendor sends them
Shorter development cycle for smaller applets	Harder to get constant updates to users

Netscape offers users the choice of buying a yearly subscription to Netscape's Navigator Web browser and server software. Subscribers can download the client and any updates from the Web at any time and automatically receive updates to the server software.

Netscape, in Mountain View, Calif., originally sold Navigator like other software, but officials noticed that rapid-fire upgrades were taxing its distribution efforts.

A subscription plan still earned money for the firm and gave everyone a little breathing room.

Microsoft Corp. is slowly following this path. It has begun to offer Service Pack upgrades for Windows 95 and Exchange Server for free over the Internet.

"As release cycles become more continuous, you will see the business model change to a more subscription-based pricing model. The customer is getting value practically every month or every other month," Schleider said.

Schleider said vendors such as Novell, Inc. and Lotus Development Corp., which traditionally have more proprietary architectures and huge distribution channels, are being challenged by this Internet-oriented future.

But Lotus is at least moving in this direction for part of its business. Lotus Notes Components, small applets built to run in Notes, will be sold and distributed online.

And Orem, Utah-based Novell recently changed the pricing model for its GroupWise collaboration software, moving it to a per-user system. That isn't subscription pricing, but it alleviates the previous confusion around charging clients per user, servers per server and gateways per site.

Looking for HTML? Check out these hot sites. See page 63.

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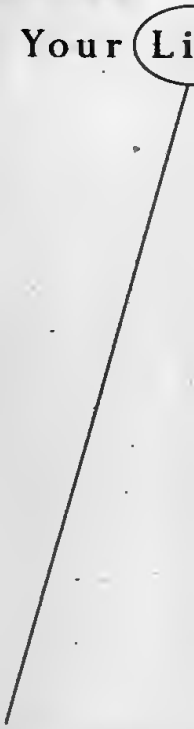

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Plug-and-play tools on the way

By Julia King

The systems integration market got a little smaller last week when Coda, Inc. and Marcam Corp. announced they would jointly market snap-together versions of their respective financial and manufacturing applications.

The mix-and-match software represeots the first commercial implementation of a plug-and-play specification developed by the Open Applications Group, Inc. (OAG), a 17-member consortium of enterprise client/server software vendors.

The group's mission is to offer users multivendor, best-of-breed, client/server applications that can be integrated out of the box without additional software interfaces.

"Writing interfaces between applications represents between 20% and 30% of a total system implementation," said Dana Gauthier, vice president of business development at Coda in Nashua, N.H.

OAG provides a standard interface, which Gauthier said promises to significantly reduce users' integration work.

So far, OAG has defined standard transaction sets for about a dozen different business objects, such as invoices and orders. Vendors that support the specification include market leader SAP AG, Baan Co., Dun & Bradstreet Software, Oracle Corp. and PeopleSoft, Inc.

Ahead of the pack

Users said they welcome the idea of preintegrated applicationa and would place vendors that sell them at the top of their lists of preferred suppliers.

"If this works, it would absolutely make me look first at other OAG-compliant vendors because it would indicate to me that I would not have to worry about integration," said Carlos Cabrera, director of corporate information systems at Sun Chemical Co., a multibillion-dollar manufacturer of inks and dyes in Fort Lee, N.J.

Sun has already purchased Coda's financial applications and software from Newton, Mass.-based Marcam, but only the Coda system is up and running. The Marcam system is scheduled to go online at three plants later this year. That's when the two systems' integration capabilities will be tested. If all goes well, the systems will be implemented at 50 sites worldwide, Cabrera said.

Managers at J. R. Simplot Co., a $2.5 billion food processing company and Marcam site in Boise, Idaho, are also interested. "It makes those products much more attractive because we don't have to go through the hassles of developing the interfaces and all of the associated headaches," said Steven Pochardt, director of manufacturing business processes at the company.

But OAG's approach isn't the only road to preintegrated software. Some of the largest application vendors, including some of OAG's own members, have started to embed so-called best-of-breed software in their own enterprise systems.

PeopleSoft, for example, has incorporated Red Pepper Technology, Inc.'s scheduling software into its recently announced manufacturing suite. Two weeks ago, Baan bought Berclain Group, Inc. and plans to embed Berclain's Moopi planning system in its enterprise software.

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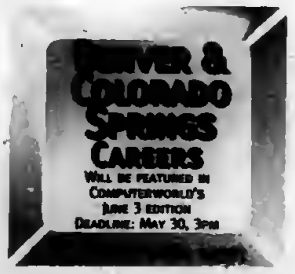

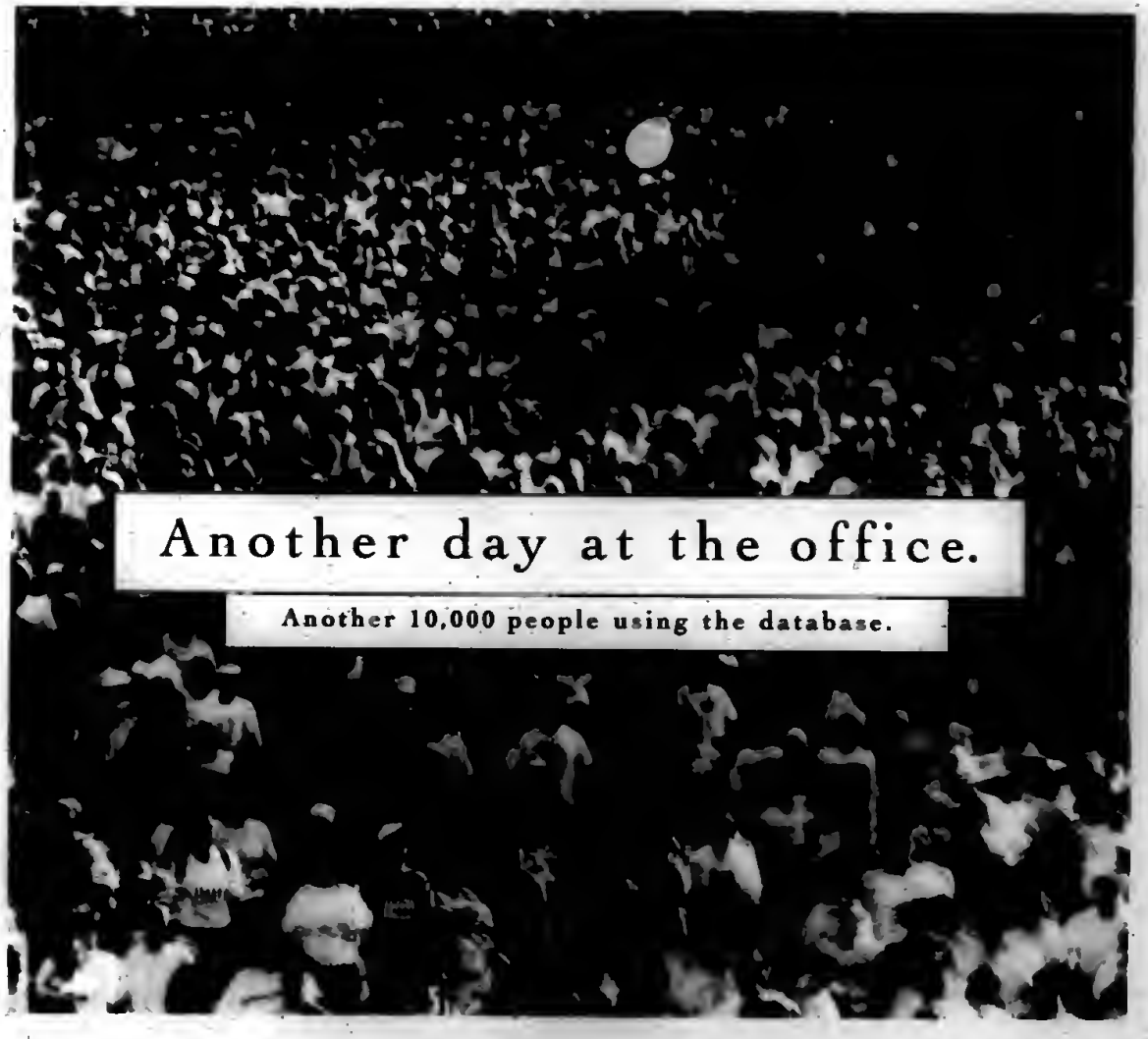

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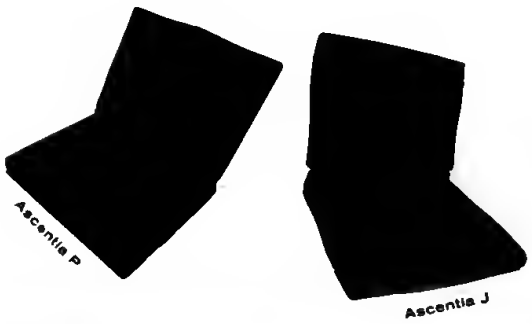

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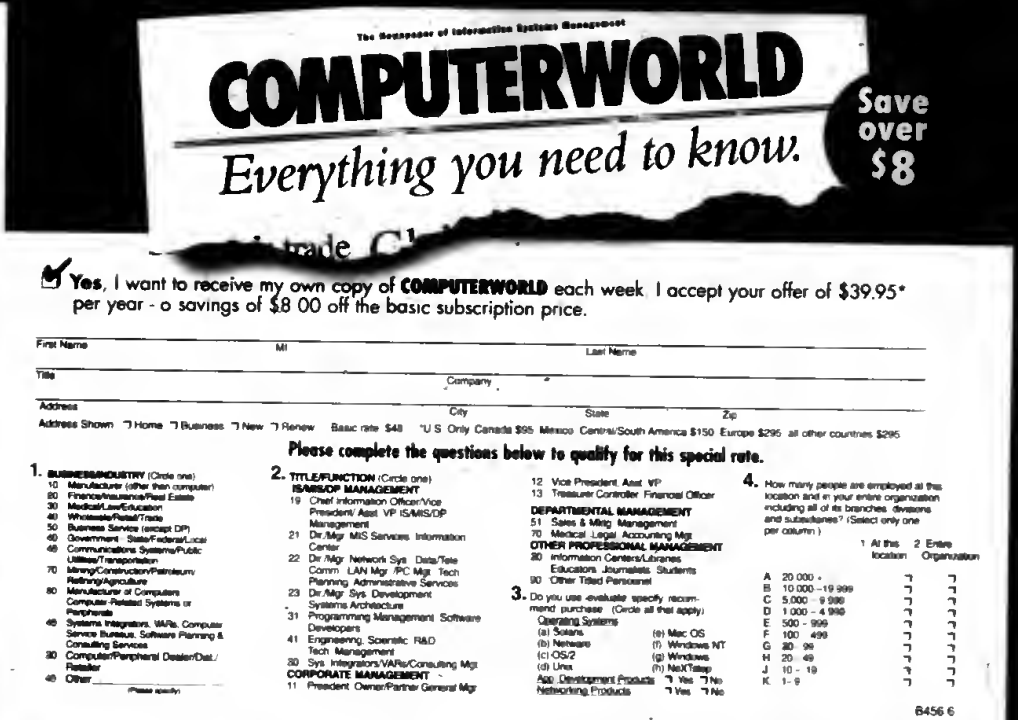

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D 1,000 – 4,999	☐	☐
E 500 – 999	☐	☐
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Notes grades 'A' at Wake Forest

By Tim Ouellette

At this university, passing Notes in class will be allowed.

Wake Forest University in Winston-Salem, N.C., plans to use Lotus Development Corp.'s Notes groupware for communications among students and staff. Those communications will include student discussions, homework assignments and grading.

Computers are common in higher education, but Wake Forest is going full tilt with laptop computers and Notes as part of its academic overhaul, dubbed "Plan for the Class of 2000." When about 1,000 freshmen enter Wake Forest this fall, they will receive IBM ThinkPads loaded with Microsoft Corp.'s Windows 95 and Office 95, Lotus Notes and Unix-based telecommunications software.

This past academic year, Wake Forest used Qualcomm, Inc.'s Eudora Internet electronic-mail software but found it didn't provide the same security and features as Notes 4.0's Notes Mail, said Jay Dominic, director of information systems at the school.

Groupware

Wake Forest developed a Notes application for the classroom called the Wake Forest Template.

It lets professors and students set up discussion groups and publish and file classroom information for reference.

It can also be used to send grades to students.

The school initially will focus its Notes training on faculty members because, Dominic said, the technology-savvy students will pick it up quickly. The bigger support issue is on the hardware side, so Dominic's department has added 10 employees to handle the expected onslaught of questions about the ThinkPads.

Distraction?

Skeptics wondered if Notes could become a classroom distraction.

But Dominic said the driving force behind the decision to use Notes campuswide was its successful use by Wake Forest's business and law schools.

Meanwhile, Wake Forest — like many organizations — is trying to figure out which applications to put on Notes and which to put on the World Wide Web.

"In the future, we are looking at doing course registration right in Notes or as a Web application," Dominic said.

More people at the university have Web programming skills, but Notes may get the nod because it boasts more security — to keep grades secret — and more third-party providers of new applications, Dominic said.

Some departments at Wake Forest already have Web sites, and at least one physics professor is experimenting with the Web for classroom use.

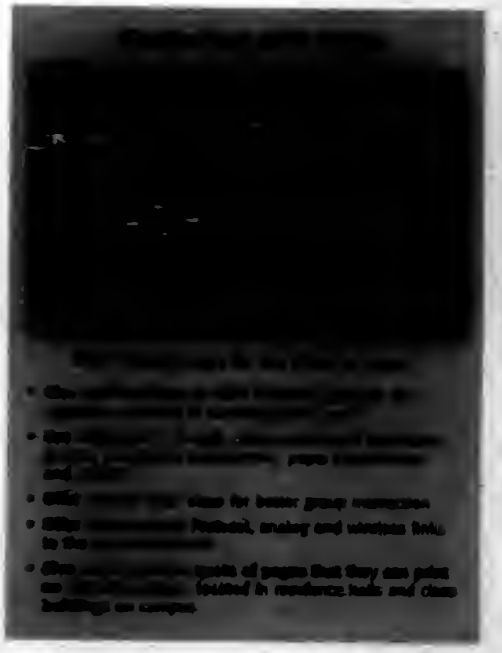
Peter Sheldon, a visiting professor of physics, said he has been posting course syllabi and homework on his Web page.

"It saves me a lot of annoyance" being asked about assignments, Sheldon said. He also posted exam and homework solutions on the Web page, which he said students visited about once per week.

Development tools bow for Notes. See page 52.

Company boost

Lotus in Cambridge, Mass., recently announced a research program with the University of Wisconsin-Extension to develop distance learning programs based on Notes. They include small business, hospitality and tourism certification programs.



Oil Change gives automatic software tune-ups

By April Jacobs

With its new Oil Change product, CyberMedia, Inc. is banking on users and information systems administrators who would rather let it handle software updates and patches.

Slated for September release, Oil Change will send an electronic-mail message to notify users when an update for their software is available.

If users decide to upgrade, Oil Change will go to the vendor's Web site, download and install the software.

CyberMedia President Unni Warrier said vendors have other ways of updating products, such as diskette mailings, but those methods aren't automatic. CyberMedia in Los Angeles expects to offer upgrades of all popular software offerings.

"I think that we will be able to align with at least the top 1,000, because we're open to everyone coming," Warrier said.

Oil Change will cost less than $70 per year per desktop, he said. The service will be free to software vendors.

Warrier said Quarterdeck Office Systems and Software Publishing Corp. have signed up for the program. He said other vendors will be announced at a later date.

CyberMedia's Oil Change *keeps users informed about updates to their software*

Single interface

Don Gates, president of Wells Advisor Information Systems LLC in San Diego, said the concept is a good one.

"It will allow software developers to spend their time developing their product and leave the update and distribution tasks to CyberMedia and [its] Oil Change product," Gates said. "The benefit to the user is it gives them a single user interface to get their updates."

> "The benefit to the user is ... a single user interface to get their updates."
>
> *— Don Gates, Wells Advisor Information Systems*

Gates said IS needs to monitor Oil Change.

He said that while end users would be responsible for their own updates and patches, companies would want to track the upgrades, which cost money.

Jesse Berst, founding editor of "Windows Watcher," an industry newsletter in Redmond, Wash., said the idea of having a central source for updates is important.

"But they'll need partners, and they'll have to convince all of the important vendors," he said. "You're going to want to feel the most important application updates are out there, otherwise you won't trust it."

Berst said the product could help to reduce support costs.

"It's shocking what percentage of problems are due to out-of-date versions," Berst noted. "Take something like video drivers: it's amazing how many times they are the culprits."

Berst said CyberMedia would have to deal with security issues. "They're not going to get partners and customers if they don't adhere to strict confidentiality."

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Computer Industry

Internet providers head for disconnect

By Randy Weston

Get ready to kiss your Internet service provider goodbye.

Analysts predict the Internet provider industry has peaked, and the next few years will be marked by mergers, buyouts and shutdowns as the providers scramble for capital to survive.

"There are about 2,500 [Internet service providers] out there today," said Tom L. Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "Of those, 2,000

Source: The Yankee Group, Boston

are going to sink, mainly the small regional guys; 300 or 400 will be acquired; and the rest will stay independent."

Number dwindling

The Yankee Group, a consultancy in Boston, predicts that by 2000 only 95 service providers will remain.

In fact, the first provider on the market was one of the first to go. Two weeks ago, UUnet Technologies, Inc. merged with business telecommunications giant MFS Communications Co.

The $2 billion deal sent the stock of UUnet competitors PSINet, Inc. and Netcom On-Line Communication Services, Inc. skyward in anticipation of more takeover activity.

Fearing a hostile takeover, PSINet took immediate steps to protect itself from any unwelcome advances, including putting itself on the market for a friendly merger.

"Since PSINet and the Internet industry are relatively young, the potential for growth in shareholder value may be as great going forward as it has been over the past five years," said William Shrader, PSINet's CEO and chairman. "However, the opportunities to leverage our current strength with the skills and market power of larger companies in strategic relationships must be assessed fully."

Nolle agreed. He said that to survive, the providers need to find benefactors with deep pockets and a willingness to invest in expensive upgrades.

"A lot of [Internet service providers] that were the darlings of venture capital companies can't get financing now," Nolle said. "Businesspeople are looking at the bottom line and saying, 'These guys can't make money.'"

Analysts said that is because a once relatively inexpensive and easy-to-run business is becoming increasingly costly as more people sign on and drive up the need for faster equipment.

"Darwin is alive and well," said Joel Maloff, the principal at The Maloff Co., an Internet consultancy in Dexter, Mich. "The real problem with garage shops is they can't compete now that the [Internet service provider] industry has evolved into a real business. They will improve or go away."

Evolution at work

That evolution, Nolle said, has involved large companies such as AT&T Corp. offering unlimited access for a fixed, relatively inexpensive monthly rate and smaller companies following suit.

The plan worked in the beginning as it gathered customers for the local providers. But it is starting to backfire as more people sign up and stay on longer, overtaxing the cheap and simple networks the start-up providers use.

Maloff and Nolle agreed that telecommunications companies are the most likely sources of capital for buying Internet providers.

"If you look at PSINet's and Netcom's worth in real dollars, the value isn't so big that [a regional Bell operating company], Sprint or some foreign telecom couldn't sweep them up and have an instant customer base," Maloff said.

Apple's 'not strategy leaves some users cold. See page 63.

Document imaging market splinters

By April Jacobs

The document imaging market is splintering into three parts, leaving some users confused.

The market has matured, and vendors' offerings are evolving into vertical market applications, component architecture or full-blown suites, according to a study by Gartner Group, Inc. in Stamford, Conn.

Loretta Goralczyk, imaging manager at international shipping company American Presidents Line Ltd., said she is inundated by new products and vendors.

"The market is changing drastically, and it's getting very confusing from an end-user perspective," she said. "With all of these changes within all of these markets, you really have to do your homework."

Goralczyk said she plans to stick with a suite-based system now in place and isn't considering a move to a component-based architecture.

Parag Patel, business process analyst at Texas Commerce Bank in Houston, said a mix of components within a suite makes for the best imaging environment.

"The suite approach is better only if it is open and componentized," he said. "You don't want one big system; you want smaller systems within so you can integrate different vendors' products with them."

Jordan Libit, vice president of marketing at FileNet Corp., said, "In our case, we made a strategic decision a few years ago that we were going to develop an extensive network of business partners who would provide customized applications or packages for specific vertical market needs."

Bob Weiler, president of Wang Software, said Wang is both a tool provider and a suite provider. "If you look at the natural evolution of the market, workflow and imaging has clearly moved to the suite model," Weiler said. "Customers want integrated products, they want ubiquity, and they want things to work together. A single vendor allows for common licensing, support and maintenance, so all those things drive it to the suite."

David McCoy, research director at Gartner Group, said, "The bottom line is that imaging has matured, so a lot of vendors are having to decide how they are going to tackle the market."

While tool vendors will address horizontal markets, including the application providers and suite providers in their own market, the application vendors will delve into vertical markets to provide business-process-oriented imaging applications, McCoy said.

Texas installs a video network. See page 57.

Bybell bolts Boston PC group

By Craig Stedman

Things keep getting tougher and tougher for the Boston Computer Society (BCS).

The once-vaunted group has been struggling to reverse an almost 40% membership drop that has left the world's largest PC user organization in a precarious financial position.

Pam Bybell *resigned after 18 months as executive director of the BCS*

Now it also is looking for a new executive director to step in at the eleventh hour of a makeover process.

Pam Bybell resigned this month, just 18 months after taking the job. Bybell couldn't be reached for comment last week, but BCS board chairman Arthur Nelson said the resignation was a surprise.

Bybell's impending departure comes at a difficult time for the BCS, which has shrunk from more than 32,000 users in 1989 to fewer than 20,000 now. The Waltham, Mass.-based group has bled enough money in recent years to deplete all of its cash reserves, Nelson said. "We're at a point now where we can't afford to lose any more money," he said.

Since individual users can now get PC information from myriad other outlets, the BCS has been crafting a new training program that would target schools and nonprofit organizations. But the details still haven't been finalized, and Nelson conceded that the board of directors is "a little bit divided" over the idea of changing the group's focus.

Jerry Schneider, a computer consultant in Burke, Va., who helped start the New York-based Association of PC User Groups, said traditional PC user groups have had to contend with change as technology went mainstream and the Internet became a major factor in disseminating information. User groups "can't just appear to be a bunch of techno-weenies anymore," he said.

But the BCS has had to contend with "a weird collection of egos" that resulted in warring factions, he added.

The BCS also has been slow to react. It still is "just scratching the surface" of the Internet, Nelson said. "The times are changing, and the BCS hasn't changed."

Bybell worked on the BCS staff for almost 10 years before becoming executive director in late 1994. The group is looking for a replacement with experience in management, budgeting and strategic planning, Nelson said.

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SPECIAL SUCCESS STORIES ISSUE

MANAGEMENT REPORT

NEWS FROM AND FOR SAS INSTITUTE USERS

SAS INSTITUTE

VOLUME 6, NUMBER 2

BANKING ON BUSINESS INTELLIGENCE:

How CoreStates Bank Supports Long-Term Decisions Through the SAS® Data Warehouse

At CoreStates Bank, it's widely recognized that exceptional financial performance ultimately depends on providing superior products and services that meet customer needs. And that's why this $40 billion multi-bank holding company relies on "the intelligent use of technology."

According to Kim Foster, Assistant Vice President of Data Warehousing and Technology in the Retail Credit Risk Department, "banking is a business of risks. We work to analyze those risks so that we can better understand them, better manage them, and ensure that we benefit by taking them."

A new enterprise information system built with SAS software, the Retail Credit Risk Information System (RCRIS), helps CoreStates Bank minimize risk while empowering decision makers at every level with reliable financial information.

"About two years ago, we began reevaluating our existing information tools in terms of changing user demands," says Foster. "We researched emerging technologies, identified and studied success stories, and re-examined our business requirements during the decision process. We found that we had three levels of users...each with different needs."

Foster found that "executives needed tools that would allow them to visualize information they were more accustomed to seeing on hardcopy reports and spreadsheets. Mid-level users, who make business decisions based on trends, needed tools that would allow them to make comparisons and adjustments with existing reports. Technical users demanded direct access to tools with strong analytical capabilities."

continued on next page

IBM

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Key Resource One of IBM's Most Successful Divisions Relies on SAS® Software

Page 3

Targeting the Right Customers at the Right Time...

Database Marketing at Reader's Digest

Based on these strategic needs, CoreStates Bank decided that RCRIS had to become an Enterprise Information System, a Decision Support System, and support a data warehouse for users. As expected, the requirements for the EIS/DSS/data warehouse system were far-ranging.

- **run on different platforms and operating systems**
- **support the existing infrastructure, corporate technology, and business standards**
- **provide development and data management tools to support all kinds of users**
- **allow for easy integration of external data and technology from multiple sources**
- **give users multidimensional views of data.**

After an extensive search, CoreStates Bank chose SAS software. "We worked directly with SAS Institute to create a system that would allow us to not only present data, but give users tools to access and slice-and-dice data for multidimensional analysis," Foster adds.

The Goal: Accurate and Timely Reporting, a Powerful Yet Easy-to-Use Interface, and Robust Analysis Tools

The Answer: SAS Software

Establishing a data warehouse was essential to CoreStates Bank's information delivery system. Says Foster, "since the data is coming from multiple sources, it is crucial that we have tools that assist us in accessing and extracting that data. For example, we have large sources of data on legacy systems. We need to extract and cleanse the data to feed other applications. By using SAS software, we can pull data from legacy systems and PC file formats. Information we were forced to obtain from multiple resources in the past can now be stored and accessed from one location."

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The Business Advisor/2 development team at the IBM 3170 Full-Color Digital Printer: Suphoj Srisupaipongsa, Valerie Crecco, Jim Jablonski, Dennis Sunberg, Manager—Business Advisor Project, Debby Telfer, Advisory Programmer; Mike Daniel (Not pictured: Bill Buchanan, Sean Sunberg)

The information system is called Business Advisor/2 (BA/2), a point and shoot approach to accessing and understanding financial, maintenance, marketing, technical, and customer satisfaction data. "Our objective in designing Business Advisor/2 is to take all of the business metrics that show trends and current business data and put them in one spot," says Debby Telfer, Advisory Programmer on the system's development team. "But BA/2 doesn't just pull and display data, it transforms data into usable business information."

The development team chose SAS software's object-oriented applications development and EIS tools as the framework for Business Advisor/2. "Two years ago, we realized that the set of products we had in place for internal decision support didn't suit our clients' needs, so we went back to the drawing board," explains Telfer. "We compared about 20 different software products using a full set of criteria, including the ability to support both decision support systems and executive information systems. In every category, SAS met or exceeded the criteria."

The customer set for the information system is diverse, Telfer adds, "and includes everyone from our CIO to our Vice President to individual customer engineers who respond to inquiries and service requests. Through JADAR (Joint Applications Design and Requirements) meetings, we ascertained the information needs of all six organizational levels within the company. Then, we came back and did a prototype of BA/2 using SAS software. We started with the SAS/EIS® component, but very quickly saw the magnitude of the data that we'd need to show our users, so we began using SAS software's object-oriented FRAME technologies and structured query language to create one screen, called the main navigational screen, that ultimately provided a single point of access—allowing users to select topics and subtopics for over a million different combinations. And at most they only have to click six times to get at any desired combination."

Staying on Top of Customer Data Means "We pay close attention to customer problems"

This ability to spot problems quickly has helped IBM Printing Systems Company respond even faster to customer needs. As Telfer explains, "we have opportunity reports that come out when a customer's product warranty is about to expire. Before paying a site visit, our customer engineers can assess each customer's service history individually. If a customer has a per-call service agreement, a graph can often show why a maintenance agreement would be more economical for the customer. It impresses customers that we pay so much attention to their problems and are never caught off guard. We can also schedule preventive maintenance on a particular printer, and generate reports and graphs anticipating when maintenance might be necessary based on our records of customer usage."

"We constantly monitor customer satisfaction and technical product performance indicators, and the data we gather is immediately accessible through Business Advisor/2," says Telfer. "Our number one job is giving the business community quality service, no matter which IBM printer they're using."

Data relating to customers, products, and other topics are stored in a variety of data sources, including DB2® and legacy systems. "Among the reasons we chose SAS software were its multiplatform capabilities and open-ended data access," states Telfer. "Because of the software's client/server architecture, we're able to develop our system independently of the data, so that Business Advisor/2 will remain a viable platform no matter what data sources come in."

"The dynamic three-dimensional navigational traversal of data within BA/2 is extraordinary," she adds. "We've reduced data storage costs drastically while *increasing* our actual data presentation 50 times over. We've been able to redirect the efforts of high-level personnel, from collecting data manually and slicing and dicing it for individual user requests, toward productive activities that directly relate to meeting customer needs. BA/2 is a hit, from a customer satisfaction perspective, a technological perspective, and a business perspective."

IBM Printing Systems Company, with operations in Boulder, Colorado, Southbury, Connecticut, and Endicott, New York, is a vertically integrated organization that specializes in print solutions for the enterprise. Its worldwide team of sales and support specialists are dedicated to providing the solutions and support required for mission-critical and departmental printing. The company's offerings include printers, printing software, consultation, systems integration, service, and maintenance. It has been one of IBM's most successful divisions for the past three years.

Reader's Digest: A Case Study in Database Marketing

At Reader's Digest Association, Inc.'s headquarters in Pleasantville, New York, the Quantitative Analysis Department supports all of the company's direct mail marketing activities. These include maintaining the rate base for *Reader's Digest* magazine and selling a wide variety of publishing products such as condensed books, cookbooks, travel books, music, videos, and multimedia products.

SAS software has been an integral part of Reader's Digest's business analysis activities for over a decade. James Lynch, Associate Director of Quantitative Analysis in the Marketing Services Group, says, "In the late 1980s, we evaluated software packages and found SAS to be superior. It met our particular needs at the time for the superiority of its diagnostics, specifically regression model building and factor analysis. As we have identified additional high volume applications, SAS software continues to meet our needs."

Quantitative analysts at Reader's Digest integrate demographics with customers' buying habits and patterns—and use SAS software for segmentation and for modeling consumer behavior to predict the best prospects for particular products. Lynch explains, "We work with marketing to design a test offer, which we mail to particular segments of our file. We evaluate their response to that offer, and if it looks like something we can generalize to the larger population on our file, the marketing people will determine the viability of the product mailing. If it looks like it's worth going ahead, we will develop models using SAS software to target the best customers in each segment. Then, based on profit and loss estimates, we decide how deep to mail into the various segments that we've created."

Contrary to how database marketing is often defined, Lynch does not see it as purely a data-driven process at Reader's Digest, but instead as an integrated one. "The marketing and quantitative groups work very closely to develop strategies and test designs to understand our customers better," he adds.

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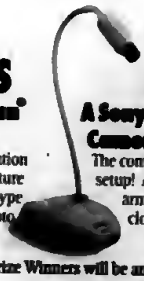

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Please pass along this issue of COMPUTERWORLD to an associate after you have finished playing the game.

This Week's TechnoTrivia™ Questions

Find the answers in this issue of Computerworld

1. In the CD-ROM game MYST, what loud mechanical device is located inside the log cabin?
2. What high-level educational programming language was designed using turtle graphics?
3. What was the in-house pre-release name for Java?
4. Intellivision, an early entry in the home videogame market, was owned by what parent company?
5. What is the term for a poorly organized program that makes excessive use of GOTO statements?"

NO PURCHASE NECESSARY. This offer is governed by a complete set of Official Rules, published on COMPUTERWORLD's web site at http://www.computerworld.com. To receive a written copy, send an SASE to COMPUTERWORLD's TechnoTrivia Rules, PO Box 4851 Marlborough, MA 01942. Find the five correct answers to the TechnoTrivia questions in each issue and complete the entry form by answering the quiz number where you find the correct answer to each corresponding question. Fax all 10 words and answer your choice of winning a weekly prize or one of 10 coming final prizes. One entry per person per week. Individuals 21 years of age or older who are U.S. residents – except employees of companies that manufacture, distribute or resell computers and computer-related equipment, employees and their families of International Data Group, Inc. (IDG), their affiliates, subsidiaries, their advertising and production agencies as well as other publishing companies serving the computer or high technology industry. Weekly and final prize winners will be selected at random from entries of those submitting proper answers. Sweepstakes drawings will be conducted by IDG MEDIA ALLIANCE, INC., an independent judging organization, whose decisions are final on all matters relating to this offer. Weekly entries must be received by 11:59 pm on Thursday following the publication of each issue of COMPUTERWORLD. All entries eligible for the Final Prizes must be received by 11:59 pm, Monday, June 3, 1996. Void where prohibited. All company and/or product names are trademarks or registered trademarks of their respective companies. Acer and the Acer logo are registered trademarks and AcerNote is a trademark of Acer America and Acer Inc. Pentium is a registered trademark of Intel Corporation.

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Powersoft.

PC Jr. II

After seeing the leaders of the Top 5 computer companies — Oracle, Sun, IBM, Apple and Netscape — on a stage in San Francisco last week endorsing the Network Computer (NC), I got an eerie flashback to a similar event in 1988. It was the announcement of the Open Software Foundation (OSF), a Unix standard-setting effort that was notable for bringing together the CEOs of bitter rivals IBM and Digital for a first-ever photo op.

The OSF failed, though, because its only reason for existence was a collective desire by its members to beat the brains out of Sun. The NC concept will fail for the same reason: Its sponsors have defined it more by what it isn't — a Wintel PC — than by what it is.

We're talking PC Jr. II here, folks.

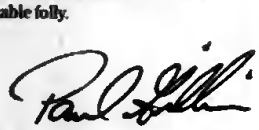
Building from the press release's modest claim that the NC "has demonstrated a broader future than the personal computer," the sponsors outlined a machine that is basically a crippled, unexpandable PC. The standards they specified are already in widespread use; nothing new there. Downloadable applets aren't even close to being ready for prime time in corporations, much less on modem-bound home machines. Who's going to bother for the sake of saving a few hundred bucks?

The silliest reason to buy an NC, of course, is that it doesn't come from Microsoft. Who cares? The anti-Microsoft message may resonate in the press and Silicon Valley, but it has precious little influence on users, many of whom actually *like* Microsoft.

There are two applications in which NCs make sense. One is as ubiquitous corporate utilities that people can use to grab messages, access files and update contact lists no matter where they are. Ergonomic, hardware and network standards are important there, but the reference guidelines announced last week provide little guidance.

The other use is as handheld devices for consumers and travelers — sort of like pocket organizers on steroids. That could be a killer app in the long run, but the technology defined last week — which includes a requirement for a 640-by-480 pixel screen — guarantees it won't happen any time soon.

Internet terminals aren't a bad idea. A network computer designed with the principal goal of hurting Microsoft is a laughable folly.



Paul Gillin, *Editor*
Internet: *paul_gillin@cw.com*
www.ultranet.com/~pgillin

Liked objectivity in protesters' story

I wanted to take the time and thank *Computerworld* writer Joseph Maglitta for the outstanding job he did on his article "Dying to make technology work for all" [CW, May 6]. I believe he gave us the story with just the facts and no opinion. Some writers may have taken into account the fact that [the fasters] were Christians and ridiculed them for their faith. Please keep up the great work!

Jonathan Sanders
Trussville, Ala.
jsanders@bham.net

OS/2 users: On the outside, looking in

There are more than a few of us readers that support, use or endorse OS/2, and the feeling of an OS/2-knowledgeable person is like watching the world from the outside. You have all the freedom you need but are disregarded and somehow don't belong. Apple [supporters] must feel the same way.

I was recently told by a mapping software vendor that they would not introduce an OS/2 product — in spite of the fact that they had quite a few customers running OS/2 — because it would run under OS/2 in a Windows session. To me, that is like telling a Windows user there would be no Windows version because the DOS product worked just fine in a DOS window.

By sheer market share, OS/2 should command half your articles, because 14 times as many machines run it as they do NT. IBM sells as many copies of OS/2 every month as Microsoft has sold of NT overall.

Peter Bach
Walden, N.Y.
peter.bach@f347.n109.z1.fidonet.org

Where were the facts?

Lisa Picarille should switch to the editorial pages rather than the news pages of *Computerworld*. Her article "Apple recall sours premium price plan" [CW, May 13], about what Apple was going to announce, was wrong on all counts. Apple CEO Gilbert Amelio did not announce that Apple was going to charge premium prices for its computers. As for all the people she quoted, they were just uninformed. For example, she mentions a problem with PowerMacintosh 8500s and backs it up with a quote that this model can't use Mac TCP — not true. I have set up in less than 45 seconds hundreds of 8500s and 9500s using Mac TCP. It is a very simple, straightforward installation using no black magic.

Roger Levit
Santa Rosa, Calif.
rlevit@sonic.net

Get the soap again

I have noticed over the years how *Computerworld* has chosen its language carefully in order to avoid giving offense to certain people when discussing matters referring to race, gender or sexual orientation. I find it rather shocking, then, for *Computerworld* to assault some of its readers with the headline "Damn, they're hot" [CW, May 6].

It is this type of hypocrisy that helped give the term "political correctness" such a bad name. It is just as egregious to us as the use of racial or other epithets that *Computerworld* would not consider using in passing, much less in an attention-grabbing headline.

Dave Fraatz
Oakdale, Minn.
dcfraatz@mmm.com

No stat-isfaction

In reply to Laura M. Freeman's letter to the editor "Get stats straight," [CW, May 6], I would like to defend the writers of "Some role model!" [CW, March 11], whose knowledge of statistics was questioned.

The authors' statistics make perfect sense if you assume they made the very common mistake of using an *and* condition in place of an *or* condition. If everybody who has made a similar mistake was forced to take Statistics 100 over, teaching would be a much more lucrative profession.

Bob Jeffrey
Bob_Jeffrey@MSN.COM
Alexandria, Va.

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gillin, Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

James Martin

Beyond pie charts and spreadsheets

Missing in all of the talk about data warehousing and data mining is the fact that it's very difficult for the human mind to grasp the business ramifications of all that data. Corporate databases have swollen from gigabytes to terabytes and show no signs of stopping. We've got a bad case of information overload.

Meanwhile, corporate executives make their decisions based on seat-of-the-pants hunches, not knowing that the information they need to make better decisions is languishing in a forgotten database. Data mining can yank selected data out of the warehouse and even look for patterns and trends. But will it be in a format that senior executives can comprehend?

To make matters worse, most corporate IS departments are stuck in the rut of believing that the only way to display data is in rows, columns and pie-chart slices. They figure if it doesn't fit in a spreadsheet, it must not be real data processing.

Pick your own view

Fortunately, data visualization software — once available only in scientific research laboratories — helps improve comprehension of complex business' data. That could mean displaying the information on a three- or four-dimensional chart, a map or even an animated, virtual reality scene that shows changes over time.

For example, Silicon Graphics uses its internally developed Data Navigator to monitor sales activity in geographic regions. Using a mouse, analysts can "fly" through sales territories and manipulate the level of detail shown. Sales targets are portrayed as hovering disks that are broken when the target is exceeded.

In essence, data visualization is a pictorial representation of data; it can be sliced, diced or plotted to create a "landscape" of the data. For added clarity, color and time-elapsed motion can be used. The goal is to turn large, complex data sets into patterns, which the human mind is good at recognizing.

If the ill-fated Barings Bank had used data visualization to display its investment risk last year, there would have been a large, red spike projecting from Singapore. This information would have been very easy to understand and could have been used by senior bank executives to take preventive actions.

The beauty of data visualization is that it can be exploited in a wide variety of business functions, from inventory control to insurance risks. Practical uses for data visualization abound:

- Marketers can combine demographic data and historical purchasing patterns with geographical information systems to better understand and precisely target their audiences.
- Telecommunications companies that collect gigabytes of data on calling patterns can design better network configurations.
- Major retailers can dig into electronic warehouses full of credit-card usage information to study buying patterns.
- Oil companies can interpret seismic data to discover new oil fields or improve drilling strategies.

Data visualization can also be used to create complex simulations and what-if scenarios. A factory manager, for example, can use the material scheduling history for the past three years to see what effect modifications would have on its throughput, machine downtime and return on capital.

Dirty data

The major hurdle facing the implementation of data visualization is dirty data. In the 1980s, there was a culture of data administration where IS was able to maintain the quality of the data collected. But by the 1990s, data administration had collapsed. End-user demands resulted in incompatible or incomplete data.

Slowly, companies are realizing that to build effective, enterprise-wide data resources, there must be an established information technology architecture. Without this top-down planning, they will have nothing but incompatible — and therefore useless — data.

The companies that can recognize, capture, analyze and use information quickly will have a competitive advantage. They will be able to see trends forming and act on them. They will be able to take advantage of brief windows of opportunity other companies might not even see.

Martin, founder of James Martin & Co. in Fairfax, Va., is a writer, lecturer and consultant on information technology. His next book, *Cybercorp*, will be released this fall.

Traders can scan a 3-D 'landscape' *of the world's stock markets to spot trends and opportunities, using software from Visible Decisions and a Reuters data feed*

How to start visualizing

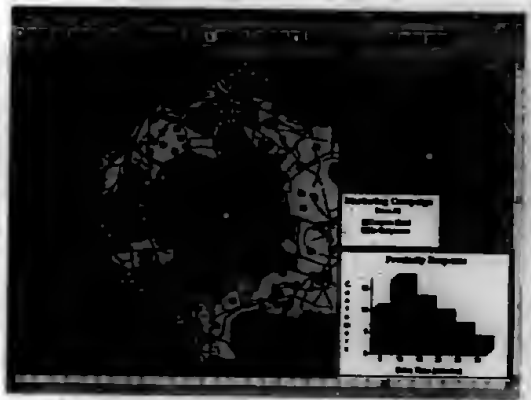
How do you get started down the road to data visualization? First, determine the business functions or "value streams" that are most critical to the success of the company. (There's no sense in building fancy graphical displays for data that doesn't matter much.)

Then figure out what types of data are needed to make decisions about those value streams. You'll need to find out where that data comes from and how it is collected. There may be potentially important data that isn't being collected at all. Don't be surprised if you need to start collecting this new data or collect old data in different ways.

Visualization software typically has run on Unix-based systems because they are well-suited for quickly plowing through large data repositories and linking to relational databases. But data visualization software will move to the desktop PC within three years, which could allow for end users to pull down subsets of the corporate mother lode via the LAN or an intranet.

For instance, Toronto-based Visible Decisions, Inc. is porting its object-oriented, 3-D data visualization tool kit from Unix boxes to Windows 95 and Windows NT.

— *James Martin*



Marketers who use desktop mapping software *from MapInfo Corp. in Troy, N.Y., can track promotional campaigns and see the proximity of customers to retail stores*

J. P. Morgan & Co. uses software *from Advanced Visual Systems, Inc. in Waltham, Mass., to analyze trends in mortgage payments and defaults across the U.S.*

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Charles B. Wang, chairman and chief executive of Computer Associates, leads a list of industry luminaries, like Bill Gates, who will be speaking on new trends, new technologies and new ways to profit from business software now and into the next century.

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Servers & PCs

Amdahl's storage array packs a throughput punch, 43

PC makers wait for the bus

Standard makes it easier to connect new peripherals

By Bob Francis

There's a new bus stopping by corporate desktops.

By year's end, major PC makers will incorporate the Universal Serial Bus (USB) in their systems. Already, Unisys Corp. in Blue Bell, Pa., has included a USB connection in its new line of Aquanta PCs.

The USB was designed to connect PCs with the standard array of peripherals — keyboard, mouse, printer and audio — and with the world of multimedia via telephones, cable boxes, scanners and external modems. The USB can also connect a PC to an Internet service provider.

Those nonstandard components previously required special connectors and, often, the use of a PC slot for items such as a scanner or phone.

Slow to develop

The USB detects which items are added or removed and determines which host resources the peripherals need. It also eliminates the need to open up the PC to add many of those devices, a potential money-saver in terms of service calls.

Analysts say the USB won't take off overnight. "The bus is going to be out there before a lot of peripheral vendors are going to have products for it," said Richard Zwetchkenbaum, a PC analyst at International Data Corp. in Framingham, Mass.

That lack of USB-compatible products has already postponed planned spring USB introductions in new desktop systems.

Dell Computer Corp. in Austin, Texas, for instance, decided not to ship a USB system until fall because it couldn't find enough USB peripherals to test.

USB-enabled PCs require USB-enabled peripherals, though many will also work with the most popular standard connectors — keyboard, mouse, printer — in early systems. Users don't have to buy new peripherals, but they can if they want optimal performance.

Though corporate PC users won't be affected immediately by the USB, they will be affected by the transition to the new connector. "We've been used to the old serial buses for so long that any change is going to take some getting used to," said Joanne Witt, manager of help desks at a high-tech company in New Jersey.

Some training will be required so information systems staffers can work with the USB, which differs radically from serial-port connections. For example, with the USB, peripherals can be added with the power on and without a system reboot. Most current PCs require the system to be switched off and rebooted so they can detect the new device.

And the USB may eliminate a common headache that users encounter when dealing with multimedia applications. With the USB, various interrupts from systems components that cause flickering and sound problems are consolidated in a single hardware interrupt that lets the operating system handle them in a standard way.

HP to beef up Unix servers

By Craig Stedman

Hewlett-Packard Co. later this year plans to pop 64-bit microprocessors into its current Unix servers rather than bring out all-new boxes.

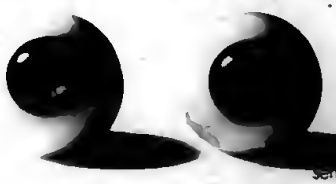
But HP has a few tricks up its sleeve that several users said are necessary to keep the HP 9000 line from being trumped by Sun Microsystems, Inc.'s powerful new servers.

HP plans to beef up its high-end T-class servers with expanded I/O and memory bandwidth to keep them from choking on the 64-bit PA-8000 chip. It also may increase the number of processors supported by the midrange K-class from four to six to better match up with the Ultra Enterprise family

HP, page 43

SHOPPING FOR A 17" MONITOR?
ENJOY THESE FABULOUS SAVINGS.

"If you stare into only one 17-inch screen this year, let it be Nokia's. . ." said the editors of *Home Office Computing*. Excellent advice, if you want to rub your eyes in astonishment – not irritation.



Even at first glance, Nokia 17" monitors stand out (actual viewing area 15.71")*. Whether it's the Nokia 447X or 447Xi professional caliber displays, Valuegraph™ 447L with built-in speakers or the **new** multimedia 447W you'll enjoy unparalleled clarity.** At their maximum refresh rates, they can render images of near photographic stability.

The longer you look, the deeper your appreciation goes. Nokia exclusives like the MicroEmission™ option and the anti-glare coating [illegible] these the world's most user-sensitive monitors – far surpassing the health and environmental criteria of MPRII. They even give you complete Plug 'n Play connectivity under Windows 95.***

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447W	100Hz	100Hz	100Hz	90Hz	79Hz	
447X	100Hz	110Hz	100Hz	90Hz	79Hz	65Hz
447Xi	150Hz	140Hz	110Hz	100Hz	85Hz	72Hz

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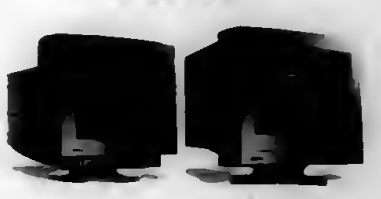
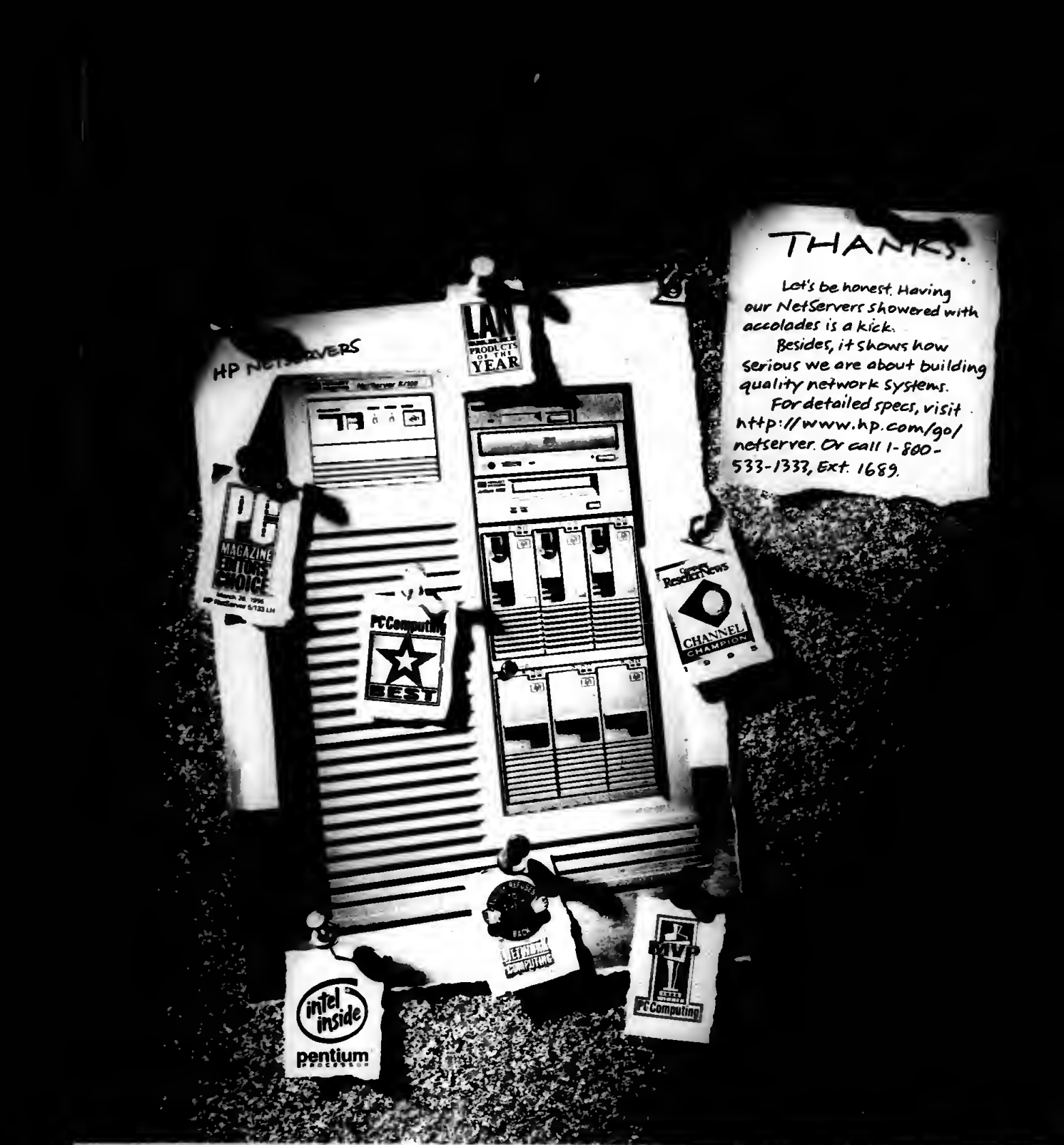


Size of CRT measured diagonally. Actual viewing area is slightly less. *The Nokia 447Xi has an actual viewing area of 15.71". **When used with an appropriate graphics card. Manufactured and designed in Finland in an ISO 9001 approved environment. ***The Nokia 447W, 447X and 447Xi are Plug 'n Play compatible. Size of CRT measured diagonally. Actual viewing size is slightly less. ©1996 Nokia Display Products Inc. Multigraph, Valuegraph, MicroEmission and FullScreen are trademarks of Nokia Display Products Inc. E-Mail: byenoke@aol.com. Prices and specifications subject to change without notice. The Energy Star emblem does not represent EPA endorsement of any product or service. All other trademarks are the sole property of their respective companies.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There's a new bus stopping by corporate desktops.

By year's end, major PC makers will incorporate the Universal Serial Bus (USB) in their systems. Already, Unisys Corp. in Blue Bell, Pa., has included a USB connection in its new line of Aquanta PCs.

The USB was designed to connect PCs with the standard array of peripherals — keyboard, mouse, printer and audio — and with the world of multimedia via telephones, cable boxes, scanners and external modems. The USB can also connect a PC to an Internet service provider.

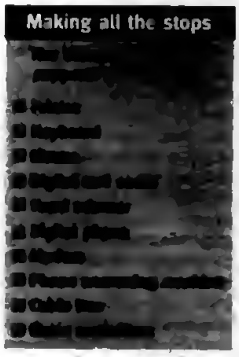
Those nonstandard components previously required special connectors and, often, the use of a PC slot for items such as a scanner or phone.

Slow to develop

The USB detects which items are added or removed and determines which host resources the peripherals need. It also eliminates the need to open up the PC to add many of those devices, a potential money-saver in terms of service calls.

Analysts say the USB won't take off overnight. "The bus is going to be out there before a lot of peripheral vendors are going to have products for it," said Richard Zwetchkenbaum, a PC analyst at International Data Corp. in Framingham, Mass.

That lack of USB-compatible products has already postponed planned spring USB introductions in new desktop systems.



Dell Computer Corp. in Austin, Texas, for instance, decided not to ship a USB system until fall because it couldn't find enough USB peripherals to test.

USB-enabled PCs require USB-enabled peripherals, though many will also work with the most popular standard connectors — keyboard, mouse, printer — in early systems. Users don't have to buy new peripherals, but they can if they want optimal performance.

Though corporate PC users won't be affected immediately by the USB, they will be affected by the transition to the new connector. "We've been used to the old serial buses for so long that any change is going to take some getting used to," said Joanne Witt, manager of help desks at a high-tech company in New Jersey.

Some training will be required so information systems staffers can work with the USB, which differs radically from serial-port connections. For example, with the USB, peripherals can be added with the power on and without a system reboot. Most current PCs require the system to be switched off and rebooted so they can detect the new device.

And the USB may eliminate a common headache that users encounter when dealing with multimedia applications. With the USB, various interrupts from systems components that cause flickering and sound problems are consolidated in a single hardware interrupt that lets the operating system handle them in a standard way.

HP's upcoming Unix even

EPS21, EPS30	Parallel processors that link up to 16 HP 9000 servers	Will ship in July
D260, D360	Low-end servers with larger cache and 50% throughput boost	Later this month
PA-8000	64-bit microprocessor that can more than double performance	June in workstations; September in servers

*Planned

HP to beef up Unix servers

By Craig Stedman

Hewlett-Packard Co. later this year plans to pop 64-bit microprocessors into its current Unix servers rather than bring out all-new boxes.

But HP has a few tricks up its sleeve that several users said are necessary to keep the HP 9000 line from being trumped by Sun Microsystems, Inc.'s powerful new servers.

HP plans to beef up its high-end T-class servers with expanded I/O and memory bandwidth to keep them from choking on the 64-bit PA-8000 chip. It also may increase the number of processors supported by the midrange K-class from four to six to better match up with the Ultra Enterprise family

HP, *page 43*

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THINGS

Right place, right time: Subsystem blocks disaster

By Thomas Hoffman

Options Clearing's Dave Gierut *says the clearinghouse met its windows, made its deadlines and bought the box that saved the day*

Imagine: A storage device conks out, and the world's largest clearinghouse for financial derivatives can't process the million-plus transactions it needs to settle deals for the New York Stock Exchange and other major markets.

That almost happened in December 1994 when a third-party service provider, whose systems run Options Clearing Corp. (OCC) in Chicago, lost two analog boards on a string of IBM 3390 storage devices.

And to make matters worse, the service provider couldn't initially pinpoint the problem.

But it all came out right in the end because OCC happened to be testing another vendor's gear at the time.

Dave Gierut, OCC's vice president of technology services, declined to name the third-party service provider whose gear crashed. But he was happy to name the box that was being tested — the remote disaster facility function on an EMC Corp. Symmetrix 5500 storage system.

Because OCC had duplicated its data in the EMC box in the month before the outage, it was able to put the EMC system into production within 3½ hours and finish processing the day's trades.

Normally, OCC would have declared a disaster and cut over to Comdisco, Inc.'s redundant systems, which mirror OCC's systems by using T1 connections. "But our biggest problem was that the service provider could not tell us that the boards were the problem," so OCC couldn't switch to Comdisco, Gierut said.

"By putting the EMC system back in, we were able to meet our windows and make our deadlines" for clearing trades that day, Gierut said.

Storage array packs throughput punch

By Michael Goldberg

The first in a planned family of Unix- and Windows NT-compatible storage arrays from Amdahl Corp. packs a throughput punch and has reliability features formerly found only in mainframe storage systems.

With that combination, observers said, users may have a new kind of open systems storage choice.

Amdahl in Sunnyvale, Calif., unveiled the LVS 4500 on May 15. Users and analysts said the LVS 4500, which is available now, lets users manage from a central location the configurations and performance of storage subsystems in remote sites.

Amdahl's LVS 4500 storage array has the following features:

Storage potential

Jeff Biggs, an information systems manager at Lexis-Nexis in Dayton, Ohio, said he is interested in the LVS system's storage management capabilities. He sends "a horde of minions" around to different sites to back up and manage disk arrays, so a centralized approach would require less labor, he said.

Biggs said he expects Amdahl to help mainframe shops such as his, which use the MVS operating system to integrate their mainframe data with information sets linked to Unix and Windows NT servers.

Amdahl's mainframe heritage has helped it design a robust and reliable storage system, said Alan Bynder, president of International Data Products, Inc., a systems consultancy in Irvine, Calif. "Coming from the world of mainframe storage, they've got an advantage." And with two power supplies on every system, there is "literally no single point of failure," he said.

The LVS system works with servers that use Windows NT and Unix variants that include Sun Microsystems, Inc.'s Solaris, IBM's AIX and Hewlett-Packard Co.'s HP-UX.

Perry Harris, an analyst at The Yankee Group in Boston, said the LVS gives users mainframe-like flexibility to partition a storage system for access by more than one Unix server (see chart). Users can establish RAID levels 0, 1, 3 or 5 in segments of the storage system, depending on the level of error recovery required.

Fara Yale, an analyst at Dataquest in San Jose, Calif., said Amdahl hasn't really invented anything new. It has "taken the latest and the best technology and put it together in something that's very attractive" to high-end users. Still, Amdahl joins IBM, HP, Data General Co. and others in the crowded storage market.

HP to beef up high-end Unix servers

CONTINUED FROM PAGE 41

that Sun introduced in April.

Users said improvements are especially necessary for the T-class, a 3-year-old system that is starting to show its age.

"Without these kinds of enhancements, we've found that it's been very difficult to scale" the T-class machines, said Andrew Stein, director of open systems at Capital One Financial Corp. in Falls Church, Va. Raw CPU performance and I/O bandwidth are limiting factors on the 14-processor system, he said.

Capital One uses more than 10 T500s to handle high-end Unix applications such as data warehousing and transaction processing. But the credit-card company is "looking at Sun very seriously" as an alternative vendor, Stein said. Stein is testing an Ultra Enterprise system and said he is "very pleased with what we've seen so far" compared with the T500.

HP needs the PA-8000 and better I/O throughput "just to stay in the game" at the high end, said Cliff Triplett, director of information systems at AlliedSignal Engines in Phoenix. The aerospace firm uses servers from HP and Sun at the engine facility.

"You can populate one of the T-class systems with a lot of processors, and it's very powerful," Triplett said. "But you could choke it in terms of file access and data backup." By comparison, Sun's new machines appear to strike a good balance between CPU power and system bandwidth, he said.

Performance should more than double when the PA-8000 is added to the HP 9000 machines in September, said Nigel Ball, worldwide marketing manager of Unix servers at HP. And I/O bandwidth on the T-class will increase fivefold to an aggregate of 1.3G byte/sec. HP also plans changes to enable the high-end boxes to use more of their 1G byte/sec. memory bus.

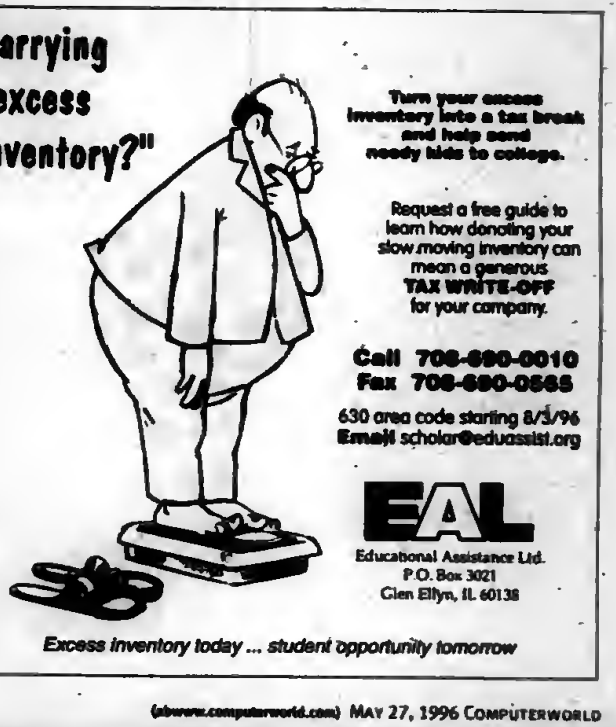
64-bit processing

One potential drawback is that the changes may make it more complicated to upgrade T-class machines to the PA-8000.

HP's lower-end servers will need only a processor board swap, but the T-class will require more extensive backplane changes that amount to "ripping out the guts of the system," said Rich Partridge, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

Though HP vows that field upgrades that take less than a day will still be possible, changing the backplane "is not my preferred mode of operation," Stein said. "You want the upgrade to be as nondestructive as possible."

But Stein said he will wait and see what HP offers as part of the upgrade process to mollify inconvenienced users.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Third parties unveil tools to facilitate Notes development, 52

Software

Smith Barney invests in NT

Branch systems to give access to wide-ranging customer data

By Mindy Blodgett

Smith Barney, Inc. is tying its future to Windows NT as the platform continues to slowly attract Wall Street and other corporate users.

Smith Barney and its parent company, Travelers Group, Inc., recently signed a $170 million contract with Compaq Computer Corp. and Microsoft Corp. Smith Barney will upgrade its hardware and software for about 475 retail branch offices; it will buy 20,000 Compaq DeskPro PCs running Microsoft's Windows NT and BackOffice suite of applications.

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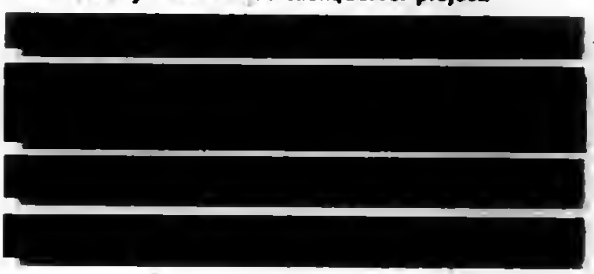
Smith Barney's distributed client/server project:



At their fingertips

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By moving to a frame-relay TCP/IP routed network for communications among branches, Barsky said, the institution hopes the increased bandwidth will help keep costs down and raise productivity. The thicker pipes will shorten the amount of time employees need to spend to transfer data, the company hopes.

After several pilots over the next few months, the NextGen project will start rolling out in September, Gal said.

Consulting conundrum

By Julia King

For every $1 spent on SAP AG's R/3 software, companies can expect to pay $10 in consulting costs.

Between 15% and 20% of all current SAP projects that involve a consultant will run more than 25% over budget and beyond deadline. This is because of the ambitious nature of most R/3 implementations coupled with inadequate project management and technical skills.

Consulting conundrum, *page 46*

Strong points

The following list of SAP consultancies shows areas in which they excel:

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Andersen Consulting	Vertical market focus
CAP Gemini Sogeti	Global reach
Deloitte & Touche	Business function*
Ernst & Young	Business functions and technology/ infrastructure skills
Hewlett-Packard	Technology/ infrastructure skills
IBM	Technology/ infrastructure skills
KPMG Peat Marwick	Vertical market focus and business functions
Origin Technology	Business style**
Price Waterhouse	Business function

* Experience with SAP modules and enhancements
** How well it can transfer knowledge to clients

Source: Gartner Group, Inc., Stamford, Conn.

Pick tries to expand its base with new marketing campaign

By Dan Richman

The Pick database management system, among the least-marketed pieces of software in computer history, has nonetheless gained a large following during its 20-year life, and now it is trying to lose its reticence.

In fact, the DBMS sports a vastly improved version and has kicked off a new marketing campaign — all of which sits well with its loyal base of users.

Pick, from Pick Systems, Inc. in Irvine, Calif., is especially good at handling text, said Bob Magill, a department head at the Missouri Botanical Gardens in St. Louis. "There's a move afoot toward Sybase here, but it's not clear whether it can do what Pick does."

Database management

Now in its third major release, called D3, Pick is built on a multidimensional model. With this, any field can hold any number of values, not just one, as in relational DBMSs.

Major RDBMS vendors such as Oracle Corp., Sybase, Inc. and Informix Software, Inc. are only now adding multidimensional capabilities. Still, their mainstream nature may make them a better choice than Pick, said Donald A. DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass.

D3 adds Open Database Connectivity and SQL support. Now shipping for IBM's AIX, it is due by July 1 for DG/UX, HP-UX and SCO Unix, with versions for Windows NT and Windows 95 promised later this year.

D3 costs as little as $360 per seat, a price that competes with the major RDBMSs. But those low prices could be offset by the high salaries needed to lure trained Pick programmers and administrators, DePalma warned. "Pick is a cult. Programmers are following the [research and development] money, which isn't going to Pick," he said.

If Pick is a cult, it's a big one. Pick trade show sponsor Gus Giobi said Pick has 1 million users in the U.S., 3 million users elsewhere and runs at 550,000 sites worldwide. Pick is especially prominent in health care, government, accounting and manufacturing.

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If it is so popular, why is Pick so obscure? It was the no-nonsense engineering slant — and the eccentricity — of founder Dick Pick that led Pick Systems to refrain from most marketing, competitive benchmarking and other activities associated with running a business, said M. Denis Hill, a vice president at the company.

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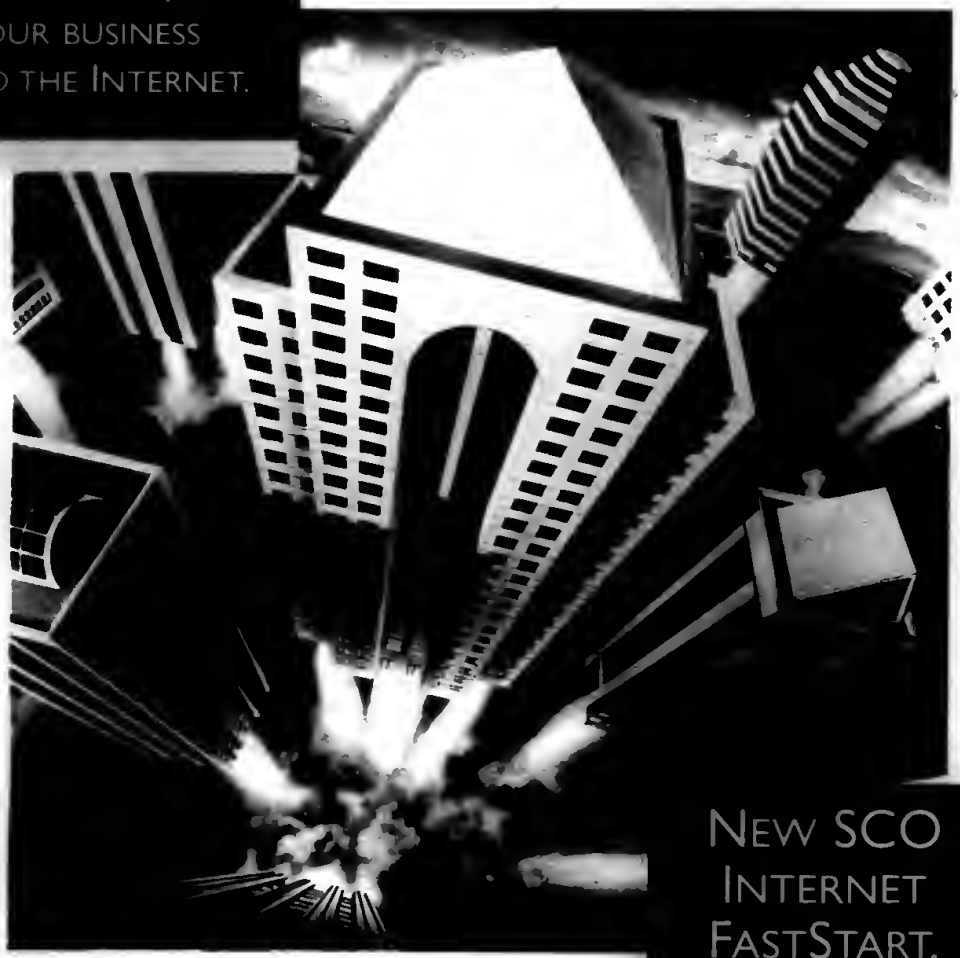

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Memory leakage the cause of GPFs

Win 95 often blamed, not the culprit

By Laura DiDio

At some point, every PC user's screen has flashed the dreaded phrase "This program has performed an illegal operation and will be shut down." Shortly thereafter, a general protection fault (GPF) occurs, and you are bounced out of the application or operating system.

These days, though, GPFs and so-called memory leakage problems — where an application doesn't reallocate memory back to the system after performing a task — seem to be cropping up more frequently in Windows 95 than in the older Windows 3.x environment.

That's what happened to Richard Harmel, a user at a Los Angeles-based corporation who began experiencing GPFs regularly as soon as he upgraded from Windows 3.1.

"In spite of my precautions, some of the very basic applications that were solid and stable under Windows 3.x are now taking regular dives on Windows 95. I'm almost at the point where I may have to abandon Windows 95 and reinstall Windows 3.1," he said.

But expert users and systems integrators said GPFs are *not* the fault of the underlying Windows 95 operating system. Ironically, it is the advances in the operating system that are confusing to the applications and precipitate the GPFs and system lock-ups, said Mark Minasi, president of Tech-Teach International, Inc. in Arlington, Va.

Nasty bugs

Older programs, such as WordStar, always used a fixed amount of memory. In contrast, today's applications have flexible, dynamic memory structures. This means they grow and expand as the system's memory changes.

"Problems occur when an application keeps commandeering memory and doesn't give it back; that's memory leakage, and it happens in every operating system," Minasi said. "If users are getting random, widespread GPFs on Win 95, it is almost certainly a bug in the hardware or a driver failure."

Scott Rackliffe, vice president of information systems at Farm Credit Financial Partners, Inc. in Agawam, Mass., said the 32-bit version of Microsoft Corp.'s Access database application is routinely beset with memory leakage problems that cause GPFs. "It's a major pain, especially for our end users who want to run six or eight reports. They have to exit Access after they run each report to get the memory reallocated," he said.

Adam Taylor, Microsoft product manager for Windows 95, said when users receive a GPF warning, Windows 95 is actually "detecting a problem that's about to occur, such as an errant application or bad memory." Minasi agreed. GPFs are "just the operating system intervening," he said.

That's small comfort to a user whose application is about to crash, said Deric Scott, a systems engineer at Information Systems Management, Inc., a systems integrator in Atlanta.

"GPFs are an annoying fact of computer life in the '90s, for which the only known cure right now is to reboot the application — or in some cases, the entire system — and get on with your life," he said.

Users can minimize the instances of GPFs by taking some proactive steps, Minasi and Scott said. They include calling the application software vendors and Microsoft to make sure you have the latest set of software drivers and network adapters.

"Don't buy no-name brands of Ethernet cards just to save a few pennies. Before you buy, make sure that your system hardware is on Microsoft's approved list," Minasi said.

What to do if you experience a General Protection Fault:

- Most times, GPFs are the result of a hardware memory error. To find out if this is the case, run a slow memory tester such as CheckIt from Touchstone Software or QAPlus from DiagSoft Corp., advised Mark Minasi, president of Tech-Teach International.
- Check your power source. GPFs often occur following electrical "brownouts," power spikes, surges or excessive network noise.
- Check your drivers. Incompatible software drivers, network adapters and video drivers are at the root of many GPFs.

Consulting conundrum

CONTINUED FROM PAGE 45

Consultants' resumes often exaggerate the extent of their actual R/3 experience.

Those are among the key findings in a recent Gartner Group, Inc. report on the $3 billion worldwide SAP R/3 implementation market.

SAP's R/3

"Overall, we found that the SAP product is sound. It's the consulting that's patchy," said Vinnie Mirchandani, an analyst at Gartner Group and author of the report (see chart, page 45).

Since introducing its phenomenally successful R/3 enterprise system in the U.S. in 1991, SAP has relied largely on systems integrators and other third parties to implement its highly complex integrated software.

In that time, the R/3 implementation market has blossomed into a gold mine for the Big Six consulting firms and dozens of smaller, regional consulting companies. Today, U.S. sales of R/3 account for more than half of the German vendor's $1.9 billion in annual revenue.

SAP consulting rates range from $65 an hour for a documentation specialist to $500 an hour for a Big Six SAP partner. Gartner Group found little pricing variation across different SAP consulting companies.

But quality can vary dramatically from one consultant to another — even within the same firm. As a result, users must look carefully at a wide range of other qualifying factors. These include a firm's experience in a particular vertical industry, its project management methodologies and implementation tools, and consultants' actual experience in the field — as opposed to their R/3 training.

"Users don't really want trained consultants. They want consultants with experience," Mirchandani said.

But without metrics for defining levels of experience, "clients don't really have a way to differentiate between one resume and another. A company may say they have experienced consultants, but that experience could be working for three months on a small piece of a project," he said.

At the University of Toronto, which began its implementation of R/3 financial modules in 1994, different consultants received different reviews.

"Generally, the consultants we had [from SAP and Deloitte & Touche] were very good. The other ones were often in the learning stages and just a little ahead of us," said Marlies Burkhard, financial information systems project director at the University of Toronto.

Burkhard's advice to users is to carefully craft a consulting contract "so you can get out of it if a person doesn't work out for you."

Good investment

The good news, according to Gartner Group, is that most major SAP consulting firms are investing heavily in expanding their SAP expertise, either by specializing in certain vertical industries or in specific SAP modules or related technologies, such as its Application Link Enabling messaging technology for distributing R/3 databases.

For example, Chicago-based Andersen Consulting, with 2,700 SAP consultants worldwide, has developed several industry-specific templates for installing R/3 at oil and gas companies.

Ernst & Young in Atlanta has 925 SAP consultants. The firm offers users a method for calculating their projected return on investment in R/3 before a project begins.

Origin Technology in Business, a Dutch firm with U.S. offices in Murray Hill, N.J., differentiates itself from the pack by offering fixed-time, fixed-price implementation service. This helped the firm earn a high mark for business style, which takes into consideration a consultancy's innovations in contracting and its ability to transfer knowledge to clients.

A recent report on SAP consultants by Boston-based Aberdeen Group, Inc. also singles out Origin Technology for its fixed-price policy. Aberdeen said the policy is particularly appealing for midtier companies that are re-engineering their enterprises around R/3 software.

Some added advice

- Consider a firm's vertical industry experience
- Match consultants expertise to specific project needs
- Give consultants incentives to deliver specific business benefits
- Be careful of claims of rapid implementations that cannot be extrapolated to larger projects
- Assign strong project managers to oversee the project
- Revisit contract terms and staffing on more than 6 months old

Source: Gartner Group, Inc., Stamford, Conn.

Briefs

Software automates client/server sales

Trilogy Development Group in Austin, Texas, has announced a suite of eight client/server applications designed to automate a company's front-end sales and marketing activities. Among other things, Selling Chain software lets salespeople create orders on a laptop computer, then transmit the orders directly through enterprise planning and manufacturing systems to the plant floor. Pricing for a four-module system starts at $5,000 per seat.

Object/relational DBMS performs

Version 2.5 of the UniSQL object/relational database management system announced last week by UniSQL, Inc. in Austin, Texas, offers consistent performance on databases that range from 500 bytes to 500M bytes, company spokesmen said. Such scalability in universal among object and object/relational DBMSs, they said. The spokesmen also claimed that the new version, available immediately, performs 30% faster than earlier implementations and complies with SQL3, allowing a single query to access both relational and object data. It costs $12,000 for four users.

Firm's tool gets Windows 95, NT

Kingston, Ontario-based Andyne Computing Ltd.'s latest version of its query and reporting tool runs on Windows NT and Windows 95. The 32-bit GQL Version 4.0, first released in 1989, also sports OLE automation capabilities. The list price is $995.

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New Products

CMF, Inc. has announced TeamFlow 4.5, a document management and team-based software application.

According to the Bedford, Mass., company, TeamFlow 4.5 is a document management product that lets users directly attach online documents created by any Windows application to any step of the management process and then view the documents dynamically. It combines the functions of deployment flowcharting, organizational charting, Gantt charting and document management.

TeamFlow 4.5 was designed to let a model builder write scripts of Notes commands and store them in individual process steps. Pricing for TeamFlow 4.5 starts at $295 for a single-user version and $1,350 for a five-concurrent-user network license.

▶ *CMF*
(617) 275-5258

Paradigm Software Development, Inc. has introduced WorkWise-Employee File 3.0, a software application for tracking employee information.

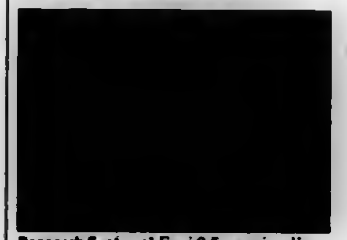
According to the Seattle company, WorkWise-Employee File 3.0 is a Windows software tool that lets managers organize employee information in a consistent, auditable fashion.

The software allows multiple access for authorized managers so they can update employee files. It features centralized management notes that include performance updates and employment data.

Pricing for WorkWise-Employee File 3.0 starts at $129.

▶ *Paradigm Software Development*
(206) 728-2281

Research Systems, Inc. has announced Envi 2.5, image processing software. According to the Boulder, Colo., company, Envi 2.5 is an image processing application that analyzes remote sensing data. It can be used to visualize and analyze any type of satellite or aircraft digital imagery.



Research Systems' *Envi 2.5 can visualize data collected from remote sensors*

Envi 2.5 includes image processing, radar, spectral analysis and file-handling tools for natural resource and environmental remote sensing. It was designed for engineers, scientists and programmers who build data analysis and data visualization applications.

Pricing for Envi 2.5 starts at $3,350. More information is available on Research Systems' home page at www.rsinc.com.

▶ *Research Systems*
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Product shorts

TeleMagic, Inc. has released TeleMagic Professional 2.0 for Windows, a contact manager that supports multifunctional wireless messaging. It includes faxing capabilities, database synchronization and an electronic-mail system. Cost: $250. TeleMagic, Dallas, Texas (214) 733-4292.... **Jasca Corp.** has announced Graphically, charting and graphing software that lets users create presentation-quality charts and grapha from spreadsheet-based information. It includes hundreds of chart templates and a report generator. Cost: $198. More information is available on Jasca's home page at www.jasca.com. Jasca, San Diego, Calif. (619) 523-0178.

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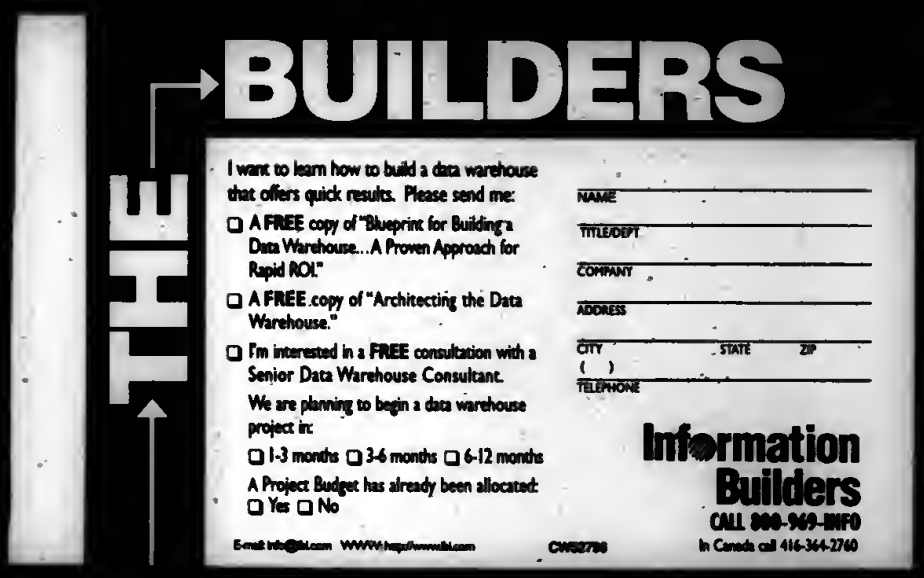
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Tools track large software projects

By Frank Hayes

Client/server projects are getting bigger and more complicated, and corporate software development managers say they need better ways to manage that increasingly complex development process.

"We want to focus only on useful work and avoid the extra load of redoing the same thing several times," said Patrick Borgna, software tool manager at the Siemens Automotive Systems Division of Siemens AG in Toolouse, France. That means keeping track of why development decisions were made so developers won't repeat the same mistakes when they are maintaining code.

Keeping development on track also means making sure that code matches the project's design and is properly tested and that documentation stays in sync with changes to code.

"You can look in the repository and see what the rules are," said Carl Pohrte, chief information services officer for McHenry County in Woodstock, Ill. "In the middle of the night, a programmer who's trying to figure out how something is supposed to be done, even in PowerBuilder, can see the rules and knows how to write it."

Client/server development

That sounds simple enough. But even though many corporate development shops have homegrown systems for tracking software development, many were designed for mainframe Cobol development and don't adapt well to client/server development that spans several platforms, languages and tools. And methodology-based computer-aided software engineering tools from companies such as Texas Instruments, Inc. and Andersen Consulting are overkill, managers said, because they require a heavy investment in tools and training for developers.

Instead, developers are turning to development tool vendors with more flexible process management tools. Visible Systems Corp. in Waltham, Mass., earlier this month announced a new version of its Visible Analyst Workbench 6.1, which will make it easier to manage the development process across an enterprise. It will ship in the third quarter.

The Windows-based modeling system, which costs about $1,900 per user and already supports a variety of object-oriented and conventional design approaches, lets developers build enterprisewide models.

Separately, SQL Software, Inc. in Vienna, Va., is rolling out PCMS Dimensions, an expanded configuration management system that provides better process management. The new version costs $5,800 per user and runs on Windows, Windows NT, Unix and VMS. It includes modules for tracking changes, archiving program objects and guiding development through a process defined by managers.

Patrick Borgna *of Siemens Automotive Systems wants developers to avoid duplicating work*

Trying to bring order to a sometimes chaotic client/server shop isn't always easy. "It certainly cost us in man-hours to get used to a whole different way of working," said Steve Montgomery, managing director at Tarragon Embedded Technology Ltd. in Cambridge, England.

"It is painful, and it's very costly," Pohrte agreed. But the payback can be substantial. "It forces you to plan and ask questions and build models before you build software. I throw paper models away all day long; I don't want to throw systems away — they're a lot more expensive."

Notes developers can now avoid that pesky code-writing thing

By Tim Ouellette

Two third-party vendors are trying to make things easier for Notes developers.

Oberon Software, Inc. in Cambridge, Mass., recently introduced Prospero 1.1, a tool to integrate data from multiple, and different, applications with Lotus Development Corp. Notes databases. And Ives Development, Inc., also in Cambridge, plans a July release for Version 1.2 of its TeamStudio object-oriented Notes design software.

With Prospero, users can populate Notes databases without running a Notes application by visually linking Notes database fields with fields in spreadsheets, contact managers, word processors and similar programs.

With Oberon Software's Prospero, *users can visually link data fields from different applications to a Notes database*

TeamStudio lets users take pieces of several Notes applications to patch together new Notes programs without writing all new code.

The products help users save time and simplify Notes application development cycles, which are usually among the more costly aspects of a Notes installation.

For example, Prospero will let users work with Notes without actually having to use the Notes client interface if they don't want to.

"You don't have to do anything on the Notes side of things," said Steve Folger, an analyst at Meta Group, Inc. in Burlingame, Calif. One example would be to have Prospero automatically pull data from a World Wide Web page — by launching a Web browser — and then pump that data right into Notes documents.

TeamStudio 1.2 will add local locking of project data dictionaries, previewing of Notes Navigators — which are new shortcut icons developers can add to their Notes application — and hot links to the Notes design environment, among other new features.

One user said TeamStudio will help streamline the Notes development process and stop duplication of development efforts.

"This tool is going to help us develop things a little more rationally and with more forethought," said David Swenson, product administrator of database services at 3Com Corp.

The Santa Clara, Calif., firm uses Notes but found that Notes developers seem to be dealing more with emergencies than providing well-planned Notes applications. Examples of emergencies include making changes to existing applications, which themselves may be confusing because they are in nonstandard format.

"We would like to change our habits to take advantage of existing standard code," Swenson said.

A basic version of TeamStudio costs $995 per developer. Prospero costs $695 with free runtime for Prospero applications.

a steam engine

Briefs

PowerBroker for OLE

Expersoft Corp. in San Diego has announced a new version of its PowerBroker object middleware system. PowerBroker CORBAplus, which already conforms to the Object Management Group's Common Object Request Broker Architecture (CORBA), will support Microsoft Corp.'s OLE in the new version. The release also supports Smalltalk, Visual Basic development and C++. PowerBroker CORBAplus will ship by early July and costs $2,995 per developer on Windows 95 or Windows NT and $5,990 per developer on Unix. A runtime cost ranges from $50 to $100 per seat, depending on the platform.

Adapting legacy apps

Adapt Technologies, Inc. in Lexington, Mass., has unveiled Adapt 5.0, a client/server application generator to re-engineer existing mainframe applications. Using a visual design system, developers can define the flow of work from one task to another and create screens for each task, then insert Cobol, PL/I, C, C++ or Basic code that has been extracted from legacy applications. Adapt automatically generates applications for Windows-based clients and Windows NT or Unix servers. Adapt 5.0 is shipping and costs $8,000 per developer.

SQL Server for Unix

Sybase, Inc. has announced SQL Server 11 for Workplace Unix, a low-cost, limited-platform version of its relational database management system. Available now for $995 per server and $195 per user, the package is licensed for use only on Sun Microsystems, Inc.'s UltraServer 1 and 2 and Enterprise 150 series, Hewlett-Packard Co.'s 9000 D and E series and IBM's RS/6000 E20, E30 and F30 series.

Object DBMS

Ontos, Inc. has announced a $495, no-runtime version of its Ontos DB object-oriented DBMS. DB/Explorer is meant for single C++ developers or small groups and locks concurrency and versioning controls. DB/Explorer will ship by July and will run under Sun's SunOS and Solaris, HP-UX and Windows NT. The new version translates Sybase and Oracle stored procedures into methods so they can be used from inside C++ applications. The server runs under Solaris and costs $995.

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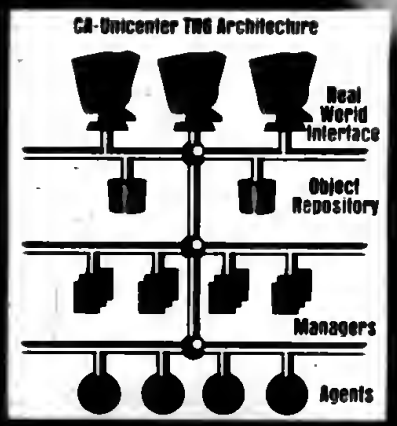


CA-Unicenter TNG is designed to meet real world requirements in today's complex environments.

CA-U… object-… tiered archi… on a distributed … repository and a man… ager/agent infrastructure. CA-Unicenter TNG sets new standards in the areas of scalability extensibility and openness

…orms an extremely powerful and open mecha… …management functions at all levels

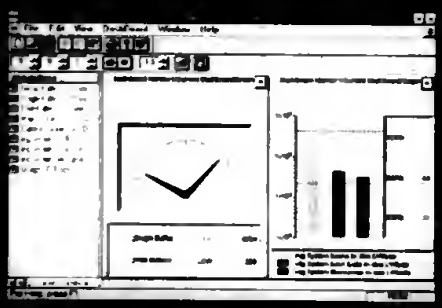
…scalability and resiliency … TNG is based on a …

CA-Unicenter … ment policies and … events and status perform d str buted configuration management and manage storage across heteroge- neous networks

In addition, agents built with CA-Unicenter TNG may be deployed in Internet and Intranet environments, for management of even the most complex environments of today and tomorrow

The Real World Interface provides a 3-D visualization of the entire IT environment. This system is highly customizable, allowing clients to specify maps, define buildings, and control layouts of networks and computer systems

Object Technology is the foundation for all aspects of CA-Unicenter TNG Its distributed object repository is used by all management functions to store information about managed objects, their properties and their relationships. It reflects status for all objects, as reported by the far-flung web of agents It drives the Real World Interface enabling it to display navigate and control objects from different management functions Any subsystem including third-party extensions can define classes and objects in the repository And all objects created by any management function are supported by the business process views which are also managed through the object repository



Robust Infrastructure. Under the CA-Unicenter TNG architecture management functions share a common infrastructure and common information across applications and across platforms while sharing a common policy-based management approach. This creates a solution set with the scalability, performance, efficiency, and openness required by the most complex IT environments.

CA Solutions.

CA-Unicenter TNG provides a comprehensive range of integrated management functions that manage all the resources of the enterprise. For example, the discovery function in CA-Unicenter TNG not only discovers the network topology and devices, but also computer systems and their hardware and software configurations. It also discovers the databases and applications that exist on those systems, and their users

Of Tomorrow.

This rich set of management functions and services are integrated across platforms networks and services It is this integration between the functions and the depth of their capabilities that makes CA-Unicenter TNG the end-to-end management solution of choice

The CA-Unicenter TNG SDK allows vendors clients and service providers to quickly and easily integrate their own technology within the system

The SDK includes wizards and easy-to-use tools, along with a complete set of interfaces—object repository, user interac-

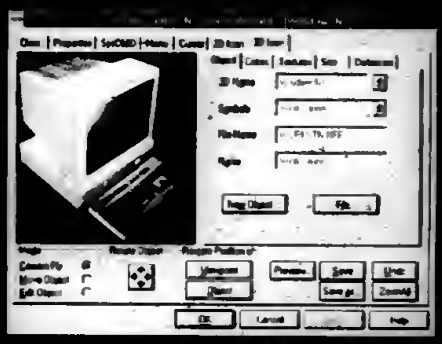
- Security Management
- Network Management
- Event/Status/Exception Management
- Database Management
- Software Delivery
- Discovery
- Workload Management
- Storage Management
- Performance And Accounting
- Management
- Back
- Configuration Management
- Asset Management

agent applications.

Partner Solutions.
CA-Unicenter TNG partners offer a huge array of solutions to further extend its capabilities. These partner solutions cover a wide range of functions, including desktop, database, and device management.

In addition, vendors of software services, database management systems and business applications build upon the monitoring and control infrastructure of CA-Unicenter TNG

By utilizing the integration capabilities of CA-Unicenter TNG, these partner solutions share policies, request services from, and provide services to other management functions. They are also closely integrated within the Real World Interface. This creates a solution set where each function builds upon the strengths of others and the whole becomes greater than the sum of its parts.



The Software Development Kit (SDK) provides the tools for extending the system, like the interactive Class Wizard.

Client Solutions.
Using the CA-Unicenter TNG infrastructure, clients can build applications that are manageable from the start. These applications are very specific to the business of the client, and by building manageability from inception, they too can be managed seamlessly from CA-Unicenter TNG.

As in the case of Partner solutions, client applications get the benefits of the multiple points of integration in CA-Unicenter TNG. Clients from such diverse industries as financial services, communications, insurance, health care, manufacturing, government, etc. are creating applications that leverage the benefits of CA-Unicenter TNG

New CA-Unicenter TNG

Why The Experts Agree.

Industry leaders welcome, and line up in support of Computer Associates' CA-Unicenter TNG:

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years. We were one of the
to recognize the value of
-Unicenter as a way for our
ers to link their IT enterpr se
mputing environment. In addi o
reselling the CA-Unicenter
oduct, Data General also uses
ternally. The CA-Un center TNG
ftware developers k l w greatly
facilitate our ability to custom ze
management of distributed
networks of AVi ON servers and
CLARiion storage system.

Rona d L. Skates
Pres dent and CEO
Data Genera Corp rat

CA-
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example of the new wave of
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New CA-Unicenter TNG

Services for Success.

The final part of the solution is the implementation and customization services for the successful deployment of enterprise management. As with any sophisticated software, this is a critical component of a complete solution. The CA-Unicenter TNG architecture lends itself to easy customization by CA clients or through third-party service providers. Some of the companies that provide implementation and customization services include CSC, Data General, Digital, EDS, Tandem, and UB.

Thus, CA-Unicenter TNG offers a complete solution for the management of the enterprise—an extremely robust, scalable, extensible and open infrastructure, a rich set of CA and partner functions, the tools for your clients to build their own functions, and the services needed to make them successful.

CA-Unicenter TNG is designed to meet the needs of any growing business, as well as extend your service capabilities and enrich your management processes as you grow your business. Point solutions can shift the management integration burden onto IT organizations, providing little interoperability. CA-Unicenter TNG features full management functions and an extensible architecture that allows the addition of third-party solutions. CA-Unicenter TNG is the solution.

Comments from the Marketplace:

"We are using CA-Unicenter TNG to deploy our applications to a level not possible..."
Steve Ruegnitz
First Vice President
Lehman Brothers

"CA-Unicenter TNG has the most advanced management product. Its availability mark... complex task of enterprise system..."
Peter Kastner
Group VP
Aberdeen Group

For more information about CA-Unicenter TNG, please call 1-800-225-5224 or visit the Computer Associates Home Page on the World Wide Web at http: www.cai.com.

In category over category, CA-Unicenter won over the competition.

PC Week Product of the Year

PRODUCT OF THE YEAR 1996

CIO Readers Choice

COMPUTER ASSOCIATES

Managers weigh switch to frame relay, 60

The Enterprise Network

Savings in focus

Texas video app reins in medical, educational costs

By Bob Wallace

Picture this: a two-way statewide video network that saves Texas big by delivering medical help and educational programming to all corners of the Lone Star State.

That's what the Texas Department of Information Resources set out to build two years ago — and that's what is expected to be complete by summer's end. It expects to save 50% annually by running the video network over a current state-owned private network instead of using public network services.

Benefits of Vidnet

By connecting far-flung cities in Texas, Vidnet:

- Reduces travel and related expenses for medical personnel
- Delivers educational programming to small and remote school systems

Source: Texas Department of Information Resources, Austin, Texas

"We took a hard look at the equipment and services each site would need for the network and found we could build and operate it ourselves [by] using extra capacity on our own network for far less," said Mark Ansboury, manager of statewide telecommunications at the Texas Department of Information Resources.

Money in the bank

But the savings don't stop there.

One purpose of the video network — called Vidnet — is to eliminate the high cost of transporting prison inmates hundreds of miles to state health centers for medical care, Ansboury said.

With Vidnet, a physician's assistant at a prison can confer with and transmit images to a doctor at the University of Texas' medical branch. This speeds post-operation follow-up work.

"Vidnet has let us access sites more easily and in a less costly manner and has extended telemedicine to a large population," said Steven Viegas, professor of orthopedic surgery at the University of Texas Medical Branch in Galveston. Vidnet is used to cover 146,000 inmates in more than 100 prisons, almost all of which are in rural areas, he added.

It costs roughly $30 to $800 per round-trip to fly one doctor to a remote Texas prison, not to mention the cost of housing, billable time and security, Ansboury added. This is done for some sites once a week.

Texas is among the first states to use video for a large-scale telemedicine application.

"Telemedicine networks are becoming increasingly popular because they allow parties to exchange massive amounts of critical information quickly," said Beth Gage, a broadband consultant at TeleChoice, Inc., a consultancy in Verona, N.J.

There is more to Vidnet than just the telemedicine application. The network is

Texas, page 60

Webman

Intranets step up to promised role in management

By Patrick Dryden

Intranets are easing access to network management information now that vendors have begun to ship promised World Wide Web interfaces to their tools.

In the past, users hassled the central operations staff with calls and requests for printed reports. Now vendors such as Cabletron Systems, Inc., Concord Communications, Inc. and Frontier Software Development, Inc. offer Web empowerment. This means more users can view status reports or performance statistics from cheap and simple computers equipped with browser software in order to track service.

Incorporating Web technologies will become a prerequisite for any network management application, according to Tom Bain, an analyst at Meta Group, Inc. in Westport, Conn.

Open arms

Delmarva Power & Light Co. in Newark, Del., plans to upgrade Cabletron's Spectrum network management software to Version 4.0, which offers a Web option for distributing reports.

"Management staff who find Spectrum daunting will find the Web interface much simpler, so we won't have as much difficulty training them," said John Scoggin, staff technical consultant for Delmarva's Advanced Technologies Group.

The help desk staff in agencies throughout Michigan can easily tap lots of network information through Spectrum's graphical Web interface instead of using a management console, said Bryan Ruhf, manager of the state's consolidated network operation center in Lansing.

"It's a lot easier to run browser than to learn Unix and management

Intranets, page 60

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of users. Sun delivers. Up to 30 processors. 30 gigabytes of memory, mainframe class I/O and 10 terabytes of storage. And with Solaris™ operating environment you get the ability to expand in all directions so you can have capacity on demand. Plus you'll have the confidence of a system engineered with the industry's best reliability features: every major system component is redundant and hot-pluggable. Naturally, these systems are backed by world-class service and round-the-clock mission critical support. Factor in Solstice™ software, a comprehensive suite of tools and services, and you've got centralized control of your entire network. Thanks to our premier software partnerships, these servers are the ideal platforms on which to run all the leading business applications. Sun Ultra Enterprise Servers. The era of enterprise network computing is here. To learn more, contact http://www.sun.com or give us a call at 1-800-786-0785 Ext. 410.

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THE NETWORK IS THE COMPUTER™

Managers weigh switch to frame-relay networks

By Kim Girard

With frame relay blazing a trail through corporate America, some network managers are grappling over whether to phase out private satellite networks.

The need for speed and reliability led The Home Depot, Inc. in Atlanta to switch from satellite to frame relay about two years ago.

"It's working very well," said Gary Crownover, senior manager of computer operations at Home Depot. "We made a wise choice." Home Depot still uses satellites to transfer video but relies on frame relay to move all data among its 430 sites.

Percy Young, manager of corporate systems at Burlingtoo Coal Factory in Burlington, N.J., said the company plans to use frame relay to link one of its remote offices where a shorter delay time and higher bandwidth are needed.

All 240 Burlington Coat stores are connected by very small aperture terminals (VSAT). Until this system becomes cost-prohibitive, the company won't be converting to frame relay, Young said.

Jay Pultz, an analyst at Gartner Group, Inc. in Stamford, Conn., said he often answers clients' satellite-to-frame-relay conversion questions.

The trend is toward frame relay when a company demands more speed, a shorter download time and better performance, Pultz said. But for one-way data transfer and international applications in remote locations, satellite can offer the better option.

Many network managers invested in VSAT networks after the AT&T Corp. divestiture, when 56K bit/sec. lines were expensive and hard to get. Satellite systems are good for downloading bulk amounts of data from corporate sites to remote sites around the world.

Now, with fiber-optic cabling installed worldwide and frame relay's ubiquitous availability, the market is providing options for some corporations that want a faster network. Satellite networks can be pushed to run at T1 speeds, while frame-relay networks can run at T3 speeds.

"People are moving away from satellites," said Howard Hecht, principal at Decisys, Inc. in Sterling, Va. "They're too crowded because they're used for video, and they're definitely too expensive. The big killer is that satellites are ending their useful life, and it's egregiously expensive to buy a new one."

Dish or baton

Satellite is a good option for companies:	Frame relay is a good option for companies:
• Opening branches at remote international sites	• Requiring more speed
[illegible]	[illegible]
• Relying on a mainframe setup	• Requiring a shorter uptime
[illegible]	[illegible]

A good buy

VSAT systems remain a good bet for retailers and car dealerships because of their ability to move large amounts of data or video one-way. For example, Ford Motor Co. is one of the most recent major auto dealers to convert to a private satellite network. Ford's network will link 6,000 sites.

However, Wal-Mart Stores, Inc., headquartered in Bentonville, Ark., is slowly phasing out leases on some of the satellites the company began using in the early 1980s.

Brief

Middleware bows

XDB Systems, Inc., in Columbia, Md., has announced Client/Server StepWise, which lets ODBC-compliant client/server applications access mainframe DB2 data. It supports direct or Distributed Relational Database Architecture access to DB2 data.

Texas video app reins in medical costs

CONTINUED FROM PAGE 57

also being used to support a distance-learning application in which educational programming can be sent to far-flung schools.

Vidnet has eight nodes now; when the network is completed by September, there will be 18 nodes. Users can dial in to the network from anywhere in the state and pay either peak or off-peak rates. It can handle video streams from 56K to 1.544M bit/sec.

The Teleos Communications, Inc. switching gear enables users to set up multipoint videoconferences — those with more than two participating sites — across the network.

The Texas Department of Information Resources used municipal bonds for the money to build the video network.

The group charges sites a small fee for network usage to pay off the bonds, Ansboury explained.

The department has spent under $1 million on the network, though it is not completed yet. Vidnet uses bandwidth that has been set aside for video, so use of the network doesn't impact other uses of the backbone network.

Intranets step up to management role

CONTINUED FROM PAGE 57

server's console operation," Ruhf said.

Users who can't get into one of the state's mainframes can pull up a network image, then look for red lights that indicate problems between them and the host, Ruhf said. Technical support people can look deeper, checking links for saturation or a high error rate.

Bye-bye paper

Phoenix-based Arizona Public Service Co. (APS) scrapped paper reports on network performance to post up-to-date data on its burgeoning intranet. The utility company relies on Concord's Network Health monitoring software to track the quality of service in its sprawling network. The new Weblink package provides a secure server with schedule and conversion software that opens up access to Network Health.

APS can make selected network reports available on demand to managers, field technicians and other interested personnel. That saves "countless hours of phone support," said Mons Ellingson, network management leader.

Instead of offering a separate package, Concord competitor Frontier now includes Web support with its remote monitor tools, so users will get "free consoles" to help meet their demand for Web delivery, a company official said.

> **"The Web will help us better support state employees by providing more network information."**
>
> *— Bryan Ruhf, State of Michigan*

But Web-based tools won't completely displace the powerful management consoles based on Unix workstations or Windows NT PCs, Scoggin cautioned.

"I won't give up the X Windows display on my workstations until we can see real-time information dynamically updated through a Web interface," he said.

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The Internet

Gradient's WebCrusader may breathe new life into DCE, 64

Pie-in-the-sky plan?

By Lisa Picarille

Macintosh users and industry watchers said Apple Computer, Inc.'s recipe to turn around the company — focusing on the Internet — may not suit everyone's taste.

"They definitely took a stand," said Mitch Hollander, a research scientist at the Food and Drug Administration in Billerica, Mass. "But not every business" is built around the Internet, he said. Also, "the strategy didn't seem to further the Mac cause."

Ken Lim, editor of "CyberMedia 2001," an industry newsletter in Cupertino, Calif., agreed that Apple's strategy doesn't particularly strengthen its appeal to non-Macintosh users.

"They are covering all their bases with a broad-ranging Internet strategy that has all the right ingredients," he said. "However, it only makes a difference to corporate users who are using Apple products at the server level — and lots are just using Macs at the client level."

In a speech two weeks ago to more than 4,000 of the Macintosh faithful at the company's annual developer conference, Apple Chairman and CEO Gilbert F. Amelio proclaimed that Apple's main thrust will be Internet access, delivery of material from the Internet to users' desktops and making it easy for customers to create content for the World Wide Web.

On the agenda

To improve customers' access to the Internet and the Web, Apple has several major initiatives, including Cyberdog 1.0, an OpenDoc-based suite of 'net applets that can be embedded in documents so that uniform resource locators can be directly accessed and act as real-time links to online data.

Also new on the access front is a version of Apple's Internet Connection Kit — available immediately — that includes the latest version of Netscape Communication Corp.'s Navigator 2.0 browser. And Apple said it will ship all future Macintoshes with 12M bytes of RAM to help accommodate graphics, text and video files often downloaded from the Web.

Other access-related announcements

Apple, *page 64*

Apple's strategic 'net recipe

Chef: Larry Tesler, vice president of Internet platforms and chief scientist

Ingredients

- **Web server support for AIX, Mac OS and possibly Windows NT Server**
- **Direct support for the Internet from within Mac OS**
- **Full support for Internet protocols including Multipurpose Internet Mail Extension and Post Office Protocol-3**
- **Cyberdog Internet applications**
- **12M bytes of RAM on every Macintosh**
- **Internet-ready version of Newton and Pippin**
- **Tools for Internet content creation and OpenDoc (soon to be announced)**

1. *Simmer entire strategy on low heat for several weeks. Bring to a boil at Apple Worldwide Developers Conference.*

2. *Serve piping hot to more than 4,000 Macintosh developers and 20 million Macintosh users.*

Sharper Image's Joshua Tretakoff: *The firm needed to upgrade its Web site to offset its catalog losses and recoup profits*

A sharper Web site

Sharper Image strives to increase cybersales, recoup catalog losses

By Mitch Wagner

A lot of companies are trying to figure out whether Internet commerce has a future, but Sharper Image Corp. believes it's already answered that question.

The San Francisco company has set a lofty goal for itself: In three years, one quarter of its sales revenue will come from cyberspace.

Corporate revenue last year was $204 million; online sales accounted for about $250,000 of that total.

The aggressive online revenue goal comes as the maker of upscale doodads and electronic gewgaws sees its traditional catalog business suffer despite good sales. Sharper Image's profit margin strained under the burden of distributing 41 million catalogs while paper prices and postage rates ballooned upward.

The cost of distributing the catalog contributed to diminished profits for the firm — net earnings were $444,000 last year, compared with $3.7 million on sales of $189 million in 1994.

To achieve its revenue

Sharper Image, *page 64*

HTML: How To

It can't hurt to start with the Beginner's Guide to HTML at www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html. The site is run by the folks at the University of Illinois, Urbana-Champaign, alma mater of Netscape founder Marc Andreessen.

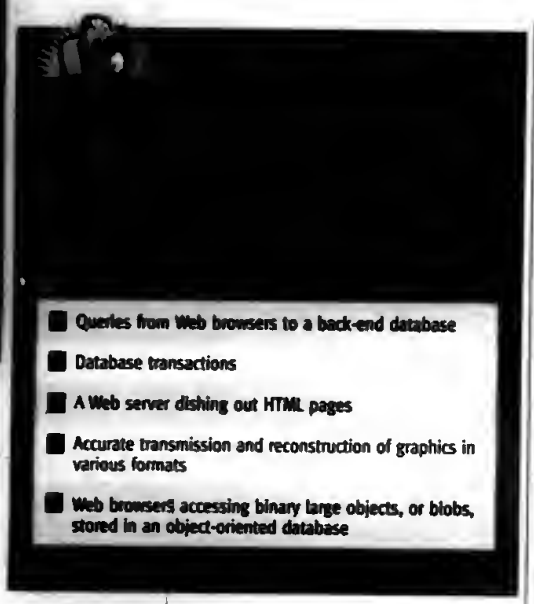
The WWW & HTML Developer's JumpStation offers tips on writing HTML and using tools to convert word processing documents to HTML. It also provides links to all kinds of conferences and papers [illegible]. See www.[illegible]/devpage/dev.[illegible]

An [illegible].html, includes lots [illegible] English advice. Topics include "[illegible] do fancy stuff" and links to [illegible] and FAQs.

Web [illegible] by Web guru Bob Allison, [illegible] after page of HTML help. [illegible] style (oh so important for [illegible] successful Web pages) [illegible] of what makes a good home page are particularly nice. Point your browser to pagina.[illegible] www.com/~bobo/masters.html.

But before you race off to build a home page, read over the official HTML specification from the World Wide Web Consortium at www.w3.org/hypertext/WWW/MarkUp/MarkUp.html. Along with the full HTML 2.0 standard, it includes a direction statement for the organization and news on the latest spec, HTML 3.2.

– *Kim S. Nash*


Queries from Web browsers to a back-end database
Database transactions
A Web server dishing out HTML pages
Accurate transmission and reconstruction of graphics in various formats
Web browsers accessing binary large objects, or blobs, stored in an object-oriented database

WebCrusader may blaze wider trail for DCE users

By Sharon Gaudin

If Gradient Technologies' WebCrusader takes off, it could slay the DCE monster that lives in the minds of many informatioo systems managers.

Gradient Technologies, Inc., a Marlboro, Mass.-based open systems application maker, is preparing to ship WebCrusader, a software family designed to develop secure applications over corporate intranets.

WebCrusader is based on the Distributed Computing Environment (DCE), an industry standard developed by the Open Software Foundation (OSF), that has been slow to catch on. The OSF has since merged with X/Open to form Open Group.

Analysts and users said DCE offers developers a high level of security, but that is generally outweighed by its staggering complexity and expense. WebCrusader, which is touted as being able to cut development time by up to 90%, may lure developers into the DCE world that many have been avoiding.

"Gradient has done an interesting tour de force to refine a monolith from OSF to a turnkey middleware service," said Patricia Borns, an analyst at Aberdeen Group, Inc. in Boston.

"If WebCrusader succeeds, DCE will have a dissemination far beyond what it would have," said Ezra Gottheil, an analyst at Hurwitz Group, Inc. in Newton, Mass. "DCE is a very big, deep, complex system. Systems built with DCE typically take three years from proposal to deployment. WebCrusader helps in that you can get all the benefits built in to DCE interfaces without developing those interfaces."

University of Michigan's Bob Riddle: *WebCrusader offers the potential for secure Web-based apps*

Gottheil said a developer who uses WebCrusader won't have to write code that uses the specific DCE calls and data.

The DCE coding is packaged, and the different components on the Internet talk to one another in DCE without developers having a hand in it.

A developer *who uses WebCrusader won't have to write DCE calls and data*

Gottheil said that until now no one had come up with a package that makes DCE both easy and quick.

WebCrusader's potential impact on DCE is great, according to Bob Riddle, assistant director at the University of Michigan's center for information technology integratioo in Ann Arbor. "WebCrusader takes advantage of a strong authentication mechanism by tunneling information through DCE, which lets you deliver secure [World Wide] Web-based applications," he said.

"This offers the potential of delivering secure interactions over the public Internet using off-the-shelf client software. Our students won't need a special Web browser for this to work for them," said Riddle, who has 100,000 users logging on to the university's network.

"We are not in a position at the university to impose software on our customers. If a student wants to buy a Mac and run Netscape on it, we have to support that."

Gradient has about 400 to 500 users, including AT&T, the Big Ten universities and the Vancouver Stock Exchange in British Columbia. WebCrusader will ship by the end of the month.

Sharper Image

CONTINUED FROM PAGE 63

goals, the company has had to redesign its 13-month-old site on the World Wide Web (www.sharperimage.com) to make the site easier to change and maintain and to integrate the site more closely with the corporate information systems infrastructure.

The Sharper Image Web site was considered to be state-of-the-art when it first went live.

It featured a database of the company's 700 products, where consumers could order products and enter credit-card numbers via secured transactions. It was pretty spiffy by the standards of the Internet circa last spring.

Stunted growth

But a few months later, the company started to see the limits of its Web site. Orders went into the sophisticated Web server, located in a Phoenix suburb, and the orders and credit-card information were faxed to the company's order fulfillment center in Little Rock, Ark.

"We needed to incorporate the site into our existing business," said Joshua Tretakoff, manager of alternative media at Sharper Image. "And we weren't going to redesign our business for a relatively small amount of online sales."

The company began working with Next Software, Inc. and Evergreen Internet, Inc., which designed the Sharper Image's Web site and the special catalog software that it runs.

Sharper Image last week unveiled the first phase in its redesign — a site built with Next's WebObjects software. Sharper Image employees will be able to update the Web site on the fly using a standard Web browser; they won't have to know Hypertext Markup Language.

IS involvement

By the end of summer, Next plans to extend the WebObjects coding to permit a direct electronic link to the Sharper Image's AS/400-based order fulfillment, inventory and billing systems.

A customer's order would be directed electronically to the order fulfillment center, and the customer would immediately be informed online about the package tracking number and when to expect delivery.

That is when Sharper Image's IS department will become involved in the project because of the links to internal systems.

Sharper Image's Internet site has been a partnership between the company's marketing department and outside consultants.

It was only recently that the IS department considered the Web site to be mission-critical. Until then, IS viewed it as a pilot project, best handled through outsourcing.

"We didn't know if it was worth $150,000 to do a full-blown system in-house until we knew whether we could do some sales there," said Vince Barriero, senior vice president and chief information officer at Sharper Image.

"But now we've had some time to justify it. It makes sense," he said.

Apple strategy

CONTINUED FROM PAGE 63

included the following:

- A Cyberdog plug-in of Adobe Systems, Inc.'s Acrobat Amber document reader that will be shipped with Apple's Internet Connection Kit.
- A plug-in version of Macromedia, Inc.'s Shockwave that works with Cyberdog to integrate multimedia with the Web.
- An Internet Enabler for Apple's Newton handheld device that supports TCP/IP.

Apple also will beef up its Internet server line. The company already has AIX and Mac OS-based servers that can be used as workgroup or departmental servers. Apple officials said a Windows NT-based server may be offered in the future.

To aid in the creation of Internet content, Apple plans to deliver QuickTime VR 2.0, which lets developers create virtual reality content that includes sound and motion.

Apple also plans to create a plug-in of its PlainTalk speech recognition technology to work with Netscape Navigator.

Finally, Apple will integrate Sun Microsystems, Inc.'s Java language with all future versions of its operating systems, including the Mac OS and Pippin, Apple's technology for linking television sets to the Internet.

Despite these plans, most observers said they remain unimpressed.

"Basically, everyone is jumping on the Internet bandwagon. Apple has no distinguishing features, nothing that separates them from anyone," Lim said. But, in fairness, he added, "everyone, not just Apple, has been taken by surprise by how popular the Web has become."

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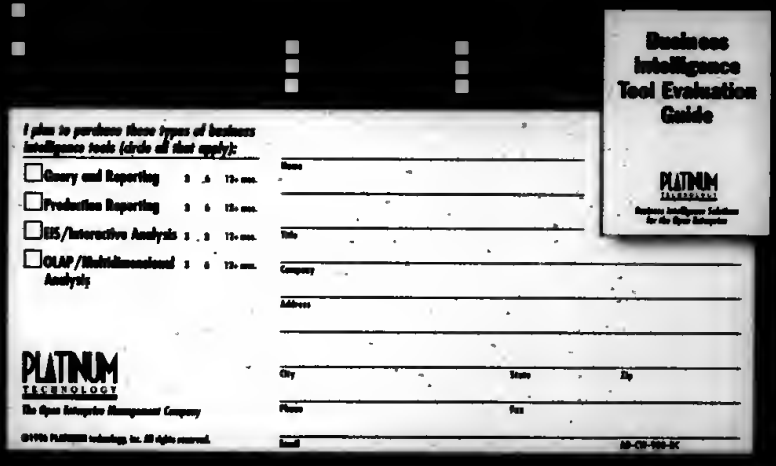

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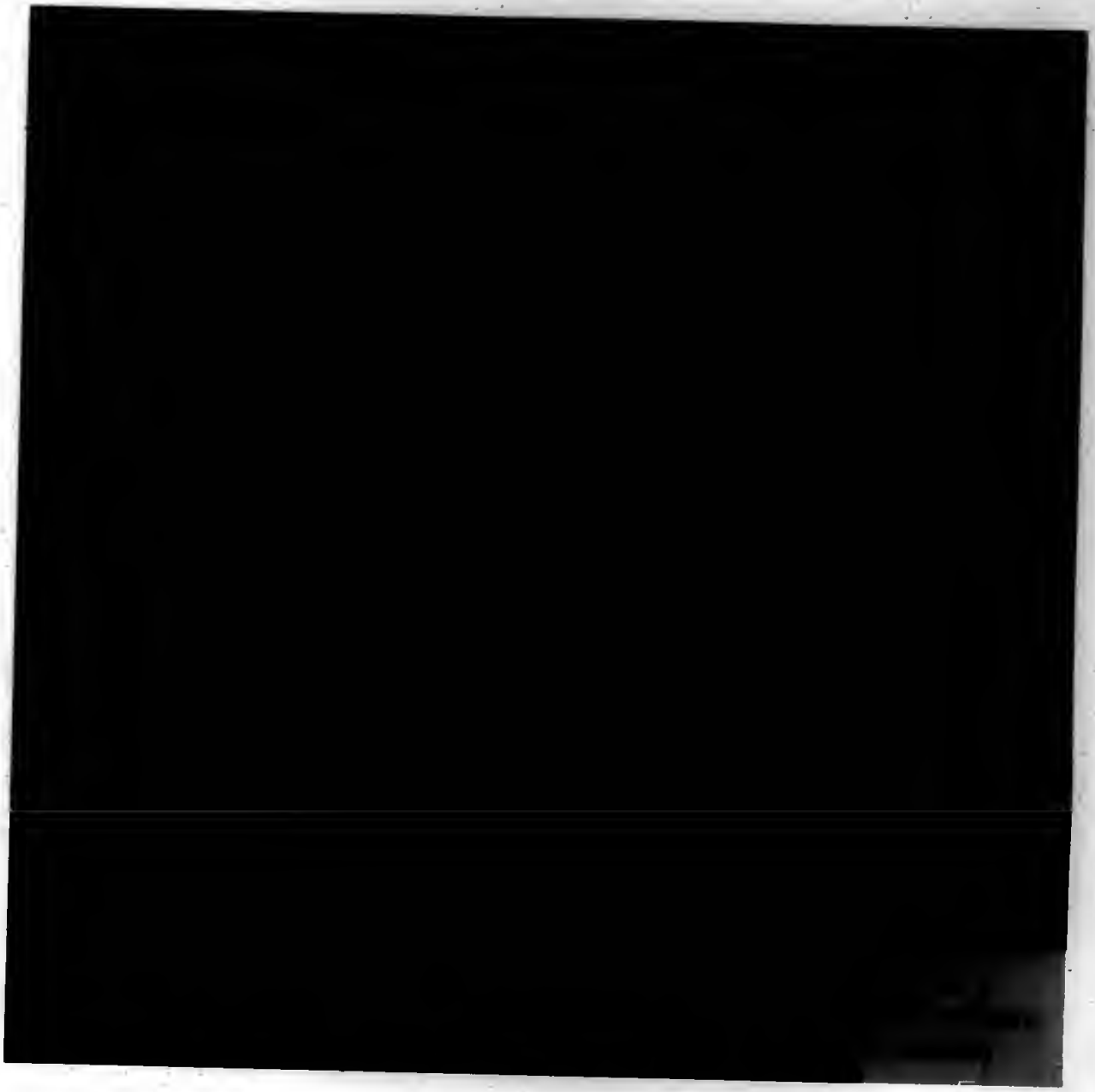

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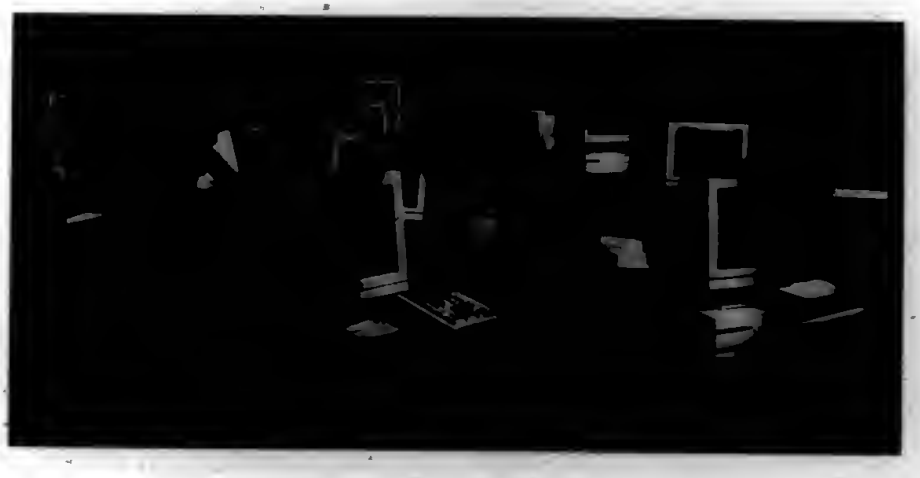

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New Products

Willow Pond Corp. has announced Marina, a PC telephony software suite for Windows 95.

According to the Newton, Mass., company, Marina includes speakerphone, answering machine, fax and data communications modules as well as a MailTalker module that lets travelers call their PCs and have their electronic mail read to them over any telephone..

The MailTalker module consolidates E-mail from a variety of sources, including any Messaging Application Programming Interface-compliant mail program and online service.

Marina's speakerphone, answering machine and fax modules use Microsoft Corp.'a Windows 95 Exchange to store messages and maintain a central phone and address book.

Pricing starts at $100.

▶ *Willow Pond*
(617) 558-5405

Arachnid Software, Inc. has introduced WebPower, World Wide Web development software.

According to the Menlo Park, Calif., company, WebPower lets users build high-quality Web sites and documents on the fly. It includes hyperlinking and management capabilities. It tracks links for document hierarchy, version editions and annotations.

WebPower also has a linking monitor that shows external documents that are linked to any document on a WebPower site.

WebPower's content authoring features were designed to facilitate collaborative content design and give users design flexibility without requiring programming commands.

Pricing for WebPower starts at $595. More information is available at Arachnid Software's home page at www.arachnid.com.

▶ *Arachnid Software*
(415) 854-7730

Harlequin, Inc. has unveiled WebMaker 2.2, a multiplatform software system that converts Adobe Systems, Inc. FrameMaker documents to Hypertext Markup Language (HTML).

According to the Boston company, WebMaker 2.2 was designed to extend FrameMaker beyond standard text-to-HTML by letting users custom-convert text, graphics, tables and equations.

The product includes autoconfiguration capabilities for document conversions.

WebMaker 2.2 also features a Java navigation panel that lets publishers include a scrollable table of contents at the top of World Wide Web pages for quick topic access.

Pricing for WebMaker 2.2 starts at $99.

More information is available at Harlequin's home page at www.harlequin.com.

▶ *Harlequin*
(617) 374-2400

Thuridion has introduced Crewoe, a suite of Internet groupware products.

According to the Scotts Valley, Calif., company, Crewoe lets businesses and individuals share and manipulate schedules, card files, documents and communicationa over the Internet and through internal networks.

The Crewoe suite includes a calendar, a card file, an administration tool, a universal in-box for consolidating and viewing messages and an application for file transfers and information sharing.

Crewoe's architecture was designed to be scalable through SQL database connectivity.

Pricing for Crewoe starts at $75 per user. More information is available at Thuridion's home page at www.thuridion.

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Firms seek legal weapons against info thieves, 72

Corporate Strategies

Feds to secure 'net access

By Gary H. Anthes
WASHINGTON

Uncle Sam next month will begin testing a system that will let the public communicate confidentially with the government over the Internet.

If all goes as planned, the system will eventually be used by millions of citizens for accessing personal tax and payroll information, negotiating and signing contracts, obtaining benefits statements and conducting other transactions that require privacy and user authentication.

Federal officials haven't said yet which applications will be online first or when those applications will be available to the public.

Keys to security

The system was first envisioned by Vice President Al Gore in 1993 when he kicked off his "reinventing government" initiative. At the time, Gore said, "Imagine this: A businesswoman walks into a post office, presents a picture ID and is given a 'public

Secure access, page 72

Software distribution

Airline network automates process for updates to 4,700 machines

By Thomas Hoffman
BOHEMIA, N.Y.

SITA, which runs the world's largest private data communications network for more than 600 airline industry players, has changed the way it distributes software updates networkwide.

As a not-for-profit cooperative, Societe Internationale de Telecommunications Aeronautiques (SITA) found it too cost-prohibitive to manually update the 4,700 workstations that use its Common Use Terminal Equipment (CUTE)/OS software each time the software is upgraded, which is about every six months.

That's why SITA recently selected a software distribution/asset management tool called DeliverIT from General Signal Networks in Shelton, Conn., to automatically route CUTE/OS updates to its users.

At $26 per workstation for 4,700 machines, or $122,200, DeliverIT should pay for itself in less than two years, said Marcel Vermeulen, manager of system projects planning at Brussels-based SITA, who works out of SITA's offices here. SITA plans to save $75,000 per year in manpower and licensed metering, which should eliminate the use of some unlicensed software, Vermeulen said.

> **At $26 per workstation for 4,700 machines, or $122,200, the software distribution package should pay for itself in less than two years.**
>
> *— Marcel Vermeulen, manager of system projects planning, SITA*

Mike Zea, a principal at Mercer Management Consulting's aviation practice in Washington, said SITA is among the first computer reservations systems to use electronic software distribution techniques.

Share and share alike

CUTE/OS is an IBM OS/2 2.1-based package used in more than 50 international airports, including Atlanta's Hartsfield International Airport and London's Heathrow International Airport. CUTE/OS was designed to enable agents from various airlines to access their own company's applications at airport check-in counters, boarding gates and ticketing areas. The terminals and printers used at these places are shared among carriers.

It became too expensive to have a SITA systems staffer "babysit 10 PCs in a railway station," Vermeulen said.

He said SITA chose DeliverIT because it was one of the few packages that ran native to OS/2. Vermeulen said SITA expects to finish beta-testing DeliverIT in Tel Aviv next month, with full

Software distribution, page 72

School district gets linked

By Kim Girard

Network manager Tom Enny describes his school district's move to frame relay as "taking a step out of the Dark Ages into modern times."

By fall, Enny will no longer need to churn out records at the Marlboro, N.J., schools' central office and send mounds of paper via interoffice mail to the middle school and the five elementary schools.

Frame relay

Instead, a Pentium 100-based machine running on 32M bytes of RAM at the central office will serve up the attendance and grade records that individual schools need. Office assistants and administrators already access electronic mail on the network through GroupWise, the groupware and messaging software from Novell, Inc. By fall, students should have Internet access in the library. Eventually, Enny said he would like to install PCs on all teachers' desktops.

Many more local school districts will be moving toward frame relay as demand for Internet access and other services increases, said Tom Jenkins, broadband consultant at TeleChoice, Inc. in Verona, N.J.

"This is just starting to be done," Jenkins said. "Most [local school districts] aren't as computer-literate, and this is a relatively new technology that not a lot of schools would be familiar with."

Working with the school superintendent, Enny decided to phase out an antiquated IBM 36 midrange system and replace it with the frame-relay network. The IBM 36 was linked to the middle school by only a private line. It was reliable, but its use was limited, he said.

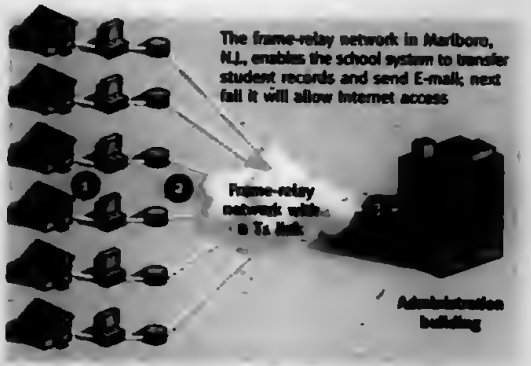
Frame relay not only reroutes information in case of switch failure, but it also lets Enny easily add new sites to the network and gives it room to grow.

"We wanted something that would provide a constant dedicated line where you don't have to dial in," Enny said. "Frame relay provides a cost-effective way of linking all schools for the purpose of E-mail and sharing databases."

For roughly $85,000, the school district contracted with Bell Atlantic Network Integrators in Fraser, Pa., to build the network. The bid included the cost of the frame-relay service, equipment, wiring for all the schools and hubs. However, it excluded computers and software. Project equipment came from RAD Data Communications, Inc. in Mahwah, N.J.

A T1 link into the district's frame-relay network supports the traffic to and from the various schools, in which 4,500 students are enrolled. About 50 people cur-

Getting linked, page 72



The frame-relay network in Marlboro, N.J., enables the school system to transfer student records and send E-mail; next fall it will allow Internet access

1. Each school has a PC attached to a stackable bridge hub
2. Each bridge hub is connected via a two-port frame-relay switch to a 56K bit/sec. link into the frame-relay network
3. The central LAN in the administration building is connected to the network via a hub router into a frame-relay switch

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digital

Firms seek legal weapons against info thieves

By Gary H. Anthes
WASHINGTON

Economic espionage against U.S. companies is on the rise, but federal criminal laws are woefully inadequate to deal with it.

"America has become a full-service shopping mall for foreign governments and companies who want to jump-start their businesses with stolen trade secrets," Sen. Herb Kohl (D-Wis.) said.

In response, Kohl recently introduced legislation that would impose fines of up to $10 million and prison terms as long as 25 years for stealing corporate trade secrets, something that is not now a federal crime.

The Federal Bureau of Investigation is investigating reports of economic espionage conducted against the U.S. from 23 countries, FBI Director Louis J. Freeh said at a recent congressional hearing on the legislation. "Many U.S. high-tech industrial sectors have been targeted," and the industrial spies include "longtime political and military allies of the U.S.," Freeh said.

Freeh didn't name the allies, but Sen. William Cohen (R-Maine) said France, Germany, Japan and South Korea are notorious offenders.

The frequency of losses due to computer hacking, bribery and various kinds of industrial espionage has jumped 323% since 1992, according to the American Society for Industrial Security International in Arlington, Va. The average loss per incident is $26 million, and losses to U.S. industry overall run at some $2 billion per month, the society claimed.

Legislation protection

Law enforcement and company officials are urging Congress to move forward with legislation that would make it easier to prosecute industrial spies, foreign or domestic. Current criminal laws, written to address the theft of physical goods, have been of limited use to prosecutors targeting information thieves.

For example, Fonar Corp. in New York said its medical device business was systematically looted by Japanese and German firms that used Fonar proprietary software, bribed employees and took other unethical actions that the U.S. legal system couldn't stop.

"Civil remedies are wholly inadequate in dealing with industrial espionage," said Fonar President Raymond Damadian. "The proposed legislation for effective sanctions appears to be the only means [to stop] these noxious practices."

In a recent survey by the San Francisco-based Computer Security Institute, more than half of the respondents reporting thefts of computer-based information attributed network intrusions to U.S. competitors that operate from the outside.

Richard Power, an analyst at the institute, said companies bent on industrial espionage traditionally have bribed competitors' employees to give them confidential information. "Now, it seems, it is easier, cheaper and safer to do it electronically," he said.

Guarding against computer crime

The FBI's National Computer Crime Squad offers the following tips:

- **Place a log-in banner to warn unauthorized users they may be subject to monitoring.**
- **Consider keystroke-level monitoring if adequate banner is displayed.**
- **Request trap-and-tracing service from the local telephone company.**
- **Consider installing caller identification.**
- **Maintain old backups to show the status of the original.**
- **Retain evidence such as tape backups and printouts.**
- **Consider using encryption, firewalls and one-time password generators.**

You can contact the National Computer Crime Squad at (202) 324-9164. For more information, visit www.fbi.com.

— Gary H. Anthes

Poor security practices invite computer crimes

In a recent survey of companies, government agencies and universities . . .

78% said employees have little or no knowledge of computer misuse laws

72% have no "Warning" banner stating that computer use may be monitored

Although more than 80% have written policies on computer misuse . . .

61% said those policies are loosely enforced

58% have no written policy on how to deal with network intrusions

Of those who experienced network intrusions last year . . .

83% didn't report them to law enforcement

Base: 428 respondents at U.S. organizations

Source: Computer Security Institute, San Francisco

Secure access

CONTINUED FROM PAGE 69

key.' Using this key card, she electronically signs a federal contract and transmits it over the [Internet] to a contracting agency. The transaction is valid, secure and paperless."

The Paperless Federal Transactions for Citizens project will be based on World Wide Web and encryption technologies. Users will insert into their PCs a "smart disk" made by Fischer International Systems Corp. in Naples, Fla. It is a computer inside a 3.5-in. diskette housing that contains software for encrypting data and securely maintaining encryption/decryption keys and passwords.

Intelligent encryption

The smart encryption disk will be obtained from the U.S. Postal Service. Acting as a "certification authority," the Postal Service will verify users' identities and add unique, tamper-proof digital identification numbers to the smart disk.

Users will also run a secure Web browser from Frontier Technologies Corp. in Mequon, Wis. They will connect to Frontier's secure Web server software at a federal agency.

The Web client and server machines first authenticate, or identify, each other using public-key-based digital signatures. Then the software encrypts the message or file being transmitted. The system will use the government's Data Encryption Standard and Digital Signature Standard.

"This is an effort to give citizens direct access to government, and it's an attempt to do more with less," said Warren Suss, a consultant in the government's use of technology and president of Warren Suss Associates in Jenkintown, Pa.

"It will do more to promote efficient government than a lot of legislative initiatives," Suss predicted.

The General Services Administration (GSA) has purchased "a few thousand" of the smart disks and will start distributing them to federal employees to test next month, said Phil Mellinger, chief engineer in the GSA's Federal Security Infrastructure Program.

The GSA's Web site says the agency is working with the U.S. Department of Agriculture, the U.S. Department of the Treasury, the National Security Agency, the National Institute of Standards and Technology and the Postal Service. Mellinger declined to comment on which agencies will be first with a pilot.

More info

Information about the GSA's Federal Security Infrastructure Program and its Paperless Federal Transactions for Citizens project can be found on the Internet at www.gsa.gov/fsi.

Mellinger said the specific applications to be tested first are less important than the overall demonstration of capability. "When people realize these kinds of capabilities exist, they will look around and say, 'What applications should we be doing?' The objective is to put the government online securely," he said.

Mellinger said secure Web access will be offered first, with secure electronic-mail capability added later this summer.

Software distribution

CONTINUED FROM PAGE 69

rollout of the software to all CUTE/OS workstations by year's end.

In its smaller CUTE/OS sites, SITA will be able to eliminate the need to pay technicians to work overtime installing software upgrades. Instead of dispatching technicians to CUTE/OS sites each time an upgrade is needed, SITA will be able to update its TCP/IP network-based workstations automatically during off-peak nighttime hours.

"What we hope to do is not to decrease manpower, but to improve productivity," Vermeulen said.

In addition, DeliverIT will be useful in places such as Heathrow, SITA's largest CUTE/OS installation, where nearly 800 CUTE/OS workstations have become increasingly difficult to manage remotely, Vermeulen said.

Getting linked

CONTINUED FROM PAGE 69

rently use the network; the number is expected to grow to 100. A second server was recently installed at the district's middle school.

The Novell 312 network is managed by RADview-PC, a Simple Network Management Protocol-based network management system at the central site. As the system grows, a rapid application development 16-port 10Base-T server will be installed at each school.

Though installation of the network has been mostly trouble-free, frequent server crashes and kinks with the Bell Atlantic frame-relay service have been a headache, Eany said.

"The toughest part about frame relay is if it goes down and [Bell Atlantic] tells me it's all right on their end, it takes a while to find out what's wrong on this end," he said. "I need it to be more stable."

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STARS COME OUT
MEET FOUR OTHER IS PROS PLAYING KEY ROLES IN ATLANTA. Page 76.

Managing

CW: What is your responsibility with the Olympic effort?

NEAL: As director of technology, I am in charge of the full scope of technologies, including [information systems], telecommunications and all auxiliary support services. This includes the planning, preparation, operations and support — the full life cycle.

CW: What had you been doing prior to this?

NEAL: I was manager of an applied research and development group in the IS area for IBM in Raleigh, N.C. I am [now] in the IBM Executive Loan Program and was loaned to the Olympics in the fall of 1991.

CW: When the Olympics run their course, will you return to IBM?

NEAL: That's the plan, but I'm not quite sure where. I'd like to stay in the Olympic movement.

CW: What do you have available to you as an IS department in terms of staff and facilities?

NEAL: We are in effect a Fortune 500 company when it comes to financial measures — a $1.6 billion budget. We're also a company that has a going-out-of-business strategy. It didn't make sense to build up a team of permanently hired people when you know you're going to have to find homes for them after the Games. So we asked the technology sponsors to provide support both in terms of equipment and staff. We have about 400 people today; 70% belong to the technology sponsors, and they're able to provide us with some very highly skilled people. We're adding another 1,500 to 2,000 technology volunteers and are in the process of training them now.

The IS function is all under one roof. We have three major application development portfolios: a results portfolio, which is

timing, scoring and real-time results; an information portfolio, which is a ... touch-screen kiosk, Internet and information [distribution] portfolio; and the operations portfolio, which manages the logistics, transportation, ticketing, planning, accommodations, etc.

Then we've got a delivery systems group that focuses on the networks, the hardware [and] the software platforms. And I have a systems operations group that, as the applications roll out, provides service to the client groups.

CW: What have been the biggest technology challenges?

NEAL: The logistics of getting all the venues [competition sites] ready for operation. It's the identification of all the technology devices needed to support the site, whether it's radios, pagers, telephones, fax machines, printers [or] computers. The basic cabling infrastructure is probably one of the more challenging aspects. We only have a limited period of time prior to an event to go in and set up the technology, and then we have to be out within a certain time.

CW: What about management challenges?

NEAL: [They include] managing the diverse relationships between each of the sports federations, whether it be basketball, volleyball or soccer. Each of them is very demanding that they have the appropriate technologies, as well as visibility. Also, the press brings with them some very demanding requirements.

Then we have the 10 technology sponsors, who are each there with significant investments. One of their primary objectives is to showcase their products. The challenge is to balance their needs to showcase with ACOG's [Atlanta Committee for the Olympic Games] needs. After all, this is not a time to be on the bleeding edge.

CW: What have been the personal challenges for you and your family?

NEAL: Travel has been a major challenge in the sense that I take fewer, but longer, trips. But the biggest challenge is the wear and tear on the body. I work 14 hours a day and seven days a week during test weeks, six days on the others. The 14 hours will probably also evolve into a few oights as well.

CW: What surprises have you encountered?

NEAL: In the test events that we ran last year, while we had read the sports books ... we dido't have a sense for the flow of competition — managing it from start to finish — and all of the exceptional situations that can occur. We now have that under our belt.

CW: Have there been any frustrations or disappointments?

NEAL: The biggest frustration is the weather right now. We've had an awful lot of rain, and it inhibits our ability to do cabling and venue setup.

CW: What has been your biggest thrill?

NEAL: Probably our initial test event, which was rowing, last fall, out on Lake Lanier. We went from several years of planning on paper and meetings, to see the team come together from the various companies — the 10 technology sponsors, the contractors and our own staff — and be able to do a real quality job on our first event. This was a real qualifying event, with world-class athletes. We had a few challenges here and there, but they were able to address the issues right on the spot and move on. It went tremendously well.

CW: What has been the impact of this experience on you personally, and what will be the career impact?

NEAL: This is the most demanding, frustrating, rewarding experience I've ever had, all in one. It's very demanding mentally and physically. And managing the various relationships can be very frustrating. But it's rewarding from the standpoint of being able to step back and say: "By God! Look at that! We talked about it, and there it is — and we did a good job of it!"

In hindsight, I wouldn't trade this experience for anything. I'm absolutely convinced that, having gone through this experience, I can get involved in any project, of any size, of any scope. It has been fantastic. There's not a single project that I'm aware of that would have the same sense of excitement, the sense of urgency, the sense of teamwork. I think anything after this is going to be somewhat of a letdown and a disappointment. ■

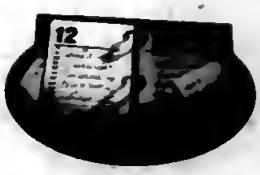
Weldon is *Computerworld*'s senior editor, Careers.

Atlanta 1996

For the book

The IS effort in Atlanta will include:

- **2,000 miles of fiber-optic cable, enough to stretch through every nook and cranny along the Atlantic from Canada to Miami.**
- **5,000 miles of copper cable: in air miles, more than a round-trip flight between Los Angeles and New York.**
- **130,000 IS users, roughly the population of New Haven, Conn.**
- **7,000 microcomputers, as many as the Washington offices of the U.S. departments of Education and State and the Government Printing Office combined.**



July workshops

A listing of workshops for IS managers. Most workshops are offered later in the year in other cities. To find the time and location most convenient for you, call the contact phone number or access the World Wide Web address.

High Tech Procurement Workshop. Orlando, Fla., **July 1-3** — Fee: $1,395. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

Business Process Re-engineering: Strategies, Techniques and Tools. Washington and Los Angeles, **July 9-12** — Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

Software Quality Assurance. Washington, **July 9-12** — Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

How to Manage, Motivate and Coach Support Professionals. Waltham, Mass., **July 15-16** — Fee: $595 to $695. Contact: Help Desk Institute, Colorado Springs, Colo. (800) 248-5667. Web address: www.HelpDeskInst.com.

Negotiating Software Licensing Agreements: Issues, Positions, Strategies and Tactics. Boston, **July 15-16**; Sacramento, Calif., **July 18-19** — Fee: $895. Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400. Web address: www.datatech.com.

Identifying and Confirming User Requirements. Washington, **July 16-19** — For those responsible for identifying user needs in a project. Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

Software Project Planning and Management. Washington and Ottawa, **July 16-19** — Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

Information Systems Project Management. New York, **July 17-19**; Chicago, **July 29-31** — Fee: $1,295 to $1,490. Contact: American Management Association, New York, N.Y. (800) 262-9699.

Effective Skills for Technical Managers. Washington, **July 23-26** — Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

Project Management: Skills for Success. Washington, **July 23-26** — Fee: $1,595 to $1,995. Contact: The Learning Tree International, Inc., Reston, Va. (800) 850-9197. Web address: www.learningtree.com.

Internet Security. Stanford, Calif., **July 29-Aug. 2** — Fee: $1,450 to $1,575. Contact: Western Institute of Computer Science, Magalia, Calif. (916) 873-0575. Web address: www-wics.stanford.edu/WICS.html.

Communication and Interpersonal Skills: A Seminar for Technical Professionals. New York, **July 31-Aug. 2** — Fee: $1,195 to $1,375. Contact: American Management Association, New York, N.Y. (800) 262-9699.

OLYMPIC STARS

Atlanta 1996

For four IS managers, Olympic dreams have become realities.

By Candee Wilde

Mark Moon

AGE: 33

TITLE: Director, systems technology

SPONSOR COMPANY: Motorola, Inc., Schaumburg, Ill.

RESPONSIBILITY: Creating a two-way radio network for ACOG officials, athletes, coaches, families and journalists

Moon has already gotten a taste of the excitement that opening day of the Centennial Olympic Games in Atlanta will generate. In April he flew to Los Angeles to see the Olympic torch begin its journey across the U.S. A fellow Motorola employee ran with the torch in Huntington Beach, Calif., at 10 p.m. that night.

"It was like a big party," Moon said the next day. "I've lost my voice from screaming."

Moon immediately accepted when he was asked in 1994 to join the Olympic effort. He is responsible for guiding Motorola's efforts to build the largest two-way radio network ever put together for a sporting event.

"I saw it as an exciting challenge, and I realized Motorola was very committed. It is a very visible position, and I thought it would be good for my career," Moon says.

Motorola is donating at least $40 million to the Atlanta project. Its network will support security, games management and transportation for athletes and spectators. Users will be able to make telephone calls, send messages and data files and page people by radio.

The network has already been built once; an exact replica was constructed in the 38,000-sq.-ft. Customer Center for Systems Integration near the company's headquarters. The Atlanta Committee for the Olympic Games (ACOG) previewed the network on the factory floor, tested various components and approved the overall design.

Moon says his greatest challenge has been defining the system's requirements and keeping them consistent as the ACOG prepares for the Olympics. "ACOG is very dynamic. It started with a small group of people. That will build to about 80,000 at Games time and then shrink back to less than 1,000 afterwards," Moon says. "There have been lots of changes in requirements. Also, it is a unique challenge to design a solution of this magnitude for an event that will last 17 days."

Michael Beck

AGE: 44

TITLE: Olympic program director

SPONSOR COMPANY: Sensormatic Electronics Corp., Boca Raton, Fla.

RESPONSIBILITY: Building the largest integrated security system ever assembled

Since the slaying of Israeli athletes during the 1972 Olympics in Munich, protecting Olympic participants and attendees has been the most urgent responsibility organizers face. The Oklahoma City bombing last year only heightened public awareness of potential danger.

As technology team leader for the first electronic security sponsor of the Olympics, Beck feels the weight of the ACOG's responsibility. The Atlanta Games are expected to be twice as large as any previous Olympics, as well as the largest peacetime event ever planned.

Sensormatic's system integrates access control, video surveillance, closed-circuit television and personal identification systems.

"Security has three components," Beck explains. "The electronic systems, the manpower contingent and the intelligence-gathering capabilities. When you have these three pieces, you have the odds in your favor."

Sensormatic is working closely with the Olympic Security Support Group. Overall security includes agents from the Federal Bureau of Investigation, Secret Service and Department of Defense, as well as state, county and regional law enforcement officials. Added to their ranks are tens of thousands of private security officers.

"Our systems hopefully will let the manpower contingent be more effective," Beck says. "We're one piece of the puzzle."

The entire system — which includes thousands of programmable, dome-shaped surveillance cameras, hundreds of thousands of security ID cards and asset protection tags — is integrated using IBM's network.

The access points to high-security areas, such as the Olympic Village, will be protected in part by a "hand-geometry reader." This biometric device records a three-dimensional topographical map of the user's hand. The resulting file is digitized and stored inside a radio-frequency chip embedded in ID badges. To gain access to a restricted area, the information in the badge must match the reading of the user's hand.

Beck says other parts of the security system are "event-driven." For example, if anything touches the fence surrounding the Olympic Village, high-speed, closed-circuit surveillance cameras will quickly turn toward that location. At the same time, an alarm will alert security personnel in the control center, who can then view the area on their PCs.

Beck isn't sure what he will do when his four-year assignment with the Olympics is completed this summer. He could go on to work for Sensormatic as a liaison with future Games or resume his former responsibilities as Sensormatic's national accounts director in the Atlanta region.

Whatever opportunities arise, "This is one of the high points of my career," Beck says.

"Now that my company is on the Internet, will a fancy port scanner algorithm make

mincemeat

of my firewall?"

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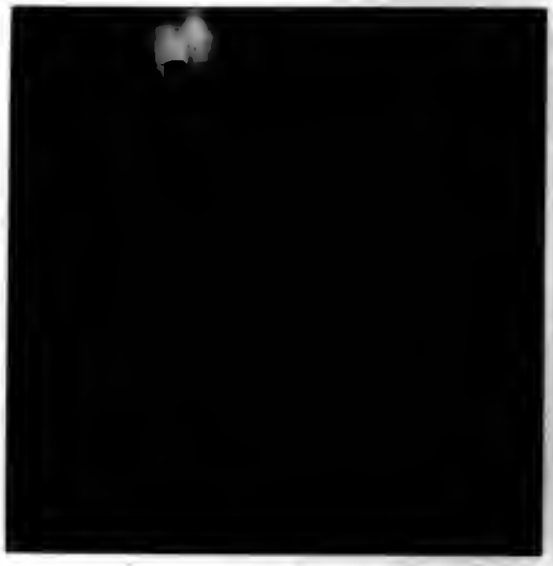
OLYMPIC STARS

Continued from page 76



Irie Jenkins

AGE: 48

TITLE: Relationship manager for architecture and technology

SPONSOR COMPANY: IBM, Armonk, N.Y.

RESPONSIBILITY: As IBM's point person, providing information systems for 130,000 users

In the early 1990s, Jenkins knew she was ready for a career change. The veteran IBM marketing manager wanted to grow professionally by taking on new challenges. When she spoke to senior management about her restlessness, she had no idea the change would be so dramatic — Jenkins was chosen to help lead the team implementing IBM's $40 million Olympics Information System.

In November 1992, Jenkins traded her post at IBM in Atlanta for a new position as the liaison between the ACOG and IBM. The experience has been the "opportunity of a lifetime," she says. It has given her a new perspective on her future with IBM and the range of opportunities that might be available when the Games are over.

"Prior to this assignment, I looked at my career and future on this one path," Jenkins says. "But because of this experience, I see many more opportunities."

For example, Jenkins pictures herself in project management. She has been exposed to an array of IBM's hardware and software products and understands how they fit together to create complete solutions.

IBM is the first company to take complete responsibility for all of an Olympic Games' IS requirements — delivering hardware, software, network, service and support. The company is also integrating products and services from other technology sponsors.

In the final weeks before the Games begin July 19, Jenkins says she can feel the esprit de corps building among all ACOG members, including the other technology sponsors.

"We feel more like partners in a project that requires full participation and support from each other. One's success is dependent on all the other parts of the whole," says Jenkins, who joined ACOG 3½ years ago, when there were 30 members. ACOG now has more than 400 members.

The Olympic Information System includes two mainframe complexes, primary and backup data centers, more than 7,000 microcomputers and more than 80 minicomputers. The network will include at least 250 LANs that link 1,000 desktop printers and more than 150 system printers. Telecommunications gear includes 10,000 voice lines, 500 data lines, 9,000 radios, 6,000 pagers and 2,000 wireless devices.

More than 100 applications are being deployed on the system, which will have 130,000 end users: 16,000 athletes and officials; 15,000 journalists; 25,000 relatives of the athletes and coaches; and 75,000 volunteers, contractors and staff members.

"This is the type of project that you dedicate yourself completely to getting done," she says. "People work early in the morning, late at night and on weekends. There's a feeling of camaraderie and a sense of ownership and pride that goes beyond any past experience."

Vince Schaeffer

AGE: 48

TITLE: Manager of Olympics document systems

SPONSOR COMPANY: Xerox Corp., Rochester, N.Y.

RESPONSIBILITY: Development of all Olympics printing and publishing systems

Schaeffer says he "chased this job pretty aggressively. The [Olympic] rings have a cachet that is hard to resist."

That aggressive pace hasn't stopped yet. Schaeffer and the other members of the Xerox team have been putting in long hours since 1993, when he moved to Atlanta to head the printing and documentation project. "There is a true sense of urgency and no opportunity for a slip," he says.

But when the 24-year Xerox veteran feels a little worn, he has an unusual way to regain his energy: He heads for the Olympic stadium, stands in the middle of the field and soaks up the thrill of being there. "This is probably the culmination of my working career," he says.

Since 1964, Xerox has provided fax machines and copiers for the Olympics. But the company hasn't before sent employees in advance or taken responsibility for the printing and publishing systems.

"When we arrived in 1993, we asked different departments what their requirements for publishing would be over the next three years," Schaeffer says. "They didn't know."

So he formed a task force to figure it out. The group estimated that the total of published training manuals, press releases and other documents would exceed 1 billion pages.

The volume of work Xerox will produce in July is staggering. The company will install 3,000 pieces of equipment and deliver 150 million sheets of paper.

One of Schaeffer's biggest challenges will be the 24 hours after the Olympic flame is extinguished, when his team will print the books (in English and French) detailing the final results in each sport. The requirement: approximately 50,000 perfect bound volumes that will total 9 million pages.

The sense of teamwork that has developed among the technology sponsors has been wonderful, Schaeffer says. For example, AT&T Corp. teamed with Xerox to figure out how to provide communications and printing capabilities at remote sites, such as race-walking and road-cycling, that do not have a physical venue such as a stadium or arena.

Xerox and AT&T transformed a 48-ft. tractor-trailer into a mobile communications center that contained a generator, air-conditioning condensers, printers and cabinetry to store 400,000 sheets of paper and all the equipment AT&T needs to connect to a local telephone service operator's network to provide analog, digital and portable-telephone service in a remote location.

Schaeffer says the work has been more personally rewarding and professionally challenging than any previous assignment. "For the past two years, making the strategic and tactical decisions has made it like running my own company." ■

Wilde is a freelance writer in Easton, Conn.

"Can we do business on the Internet without getting

bamboozled

by some wily hacker?"

COMMERCE

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SPECIAL ADVERTISING SUPPLEMENT

AN INDUSTRY UPDATE WRITTEN BY INTERNATIONAL DATA CORPORATION AND SPONSORED BY NOVELL, INC.

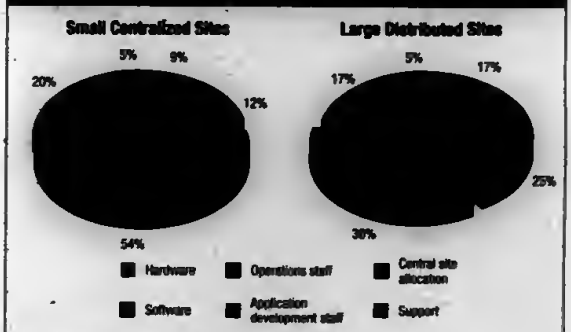
Meeting the Challenge of Client-Server Computing

Maximizing Return-on-Investment of Network Computing

The migration to client-server computing is affecting organizations both large and small almost everywhere on the planet. Computer users today have extensive access to global network-based resources, including communication gateways to other companies, individuals, and markets worldwide. Signs of this connectedness abound:

- Last year the number of LAN users worldwide hit nearly 100 million, double the number in 1993. By 1999 the number will double again
- In the same year the number of people in the world with electronic mail boxes topped 40 million. By 1999 the number will be over 125 million
- Groupware users numbered over 30 million worldwide by the end of 1995; by 1999 they will number over 250 million

Figure 1 — The Hidden Costs of Client-Server



Source: International Data Corporation, 1996

So we are heading for a wired workplace, a wired marketplace, even a wired society. However, there is a price to be paid for all this connectivity. The nearly universal implementation of client-server systems requires living with new levels of complexity and new hardware and software that people must be trained to use. Moreover, highly skilled personnel must be hired to install, manage, maintain, and administer these far-flung networks. The result is that staffing costs have become the largest contributor to total networked computing costs, regardless of the size of the installation (see Figure 1).

Until now, companies have justified the costs and complexities of client-server computing by competitive advantage–it is a very flexible and adaptable computing style. But when client-server is the norm, where will the competitive advantage lie?

IDC believes that companies that learn to manage their networked resources through technology and training will win out over their peers in the long run. Companies that understand the true costs and true benefits of client-server computing will generate quicker return for their investments. Companies that relentlessly optimize, integrate, and upgrade existing systems will stretch IT resources further and be able to reinvest sooner than competitors taking a wait-and-see approach.

Areas of Opportunity

IDC and Novell have teamed to produce this White Paper in order to help IT managers develop a strategy for maximizing return on investment in networked computing resources. It is the executive overview of three studies researched and written by IDC and sponsored by Novell. In the research it conducted,

Driving Down Networking Costs

GroupWise:

Typical annual return-per-user of 334%

Nearly $400,000 a year saved in phone costs at Farmland Foods

Courier costs cut $16,000 a year at Sheppard, Mullin, Richter & Hampton

NetWare 4:

On average 15% less expensive than NT Server from Microsoft

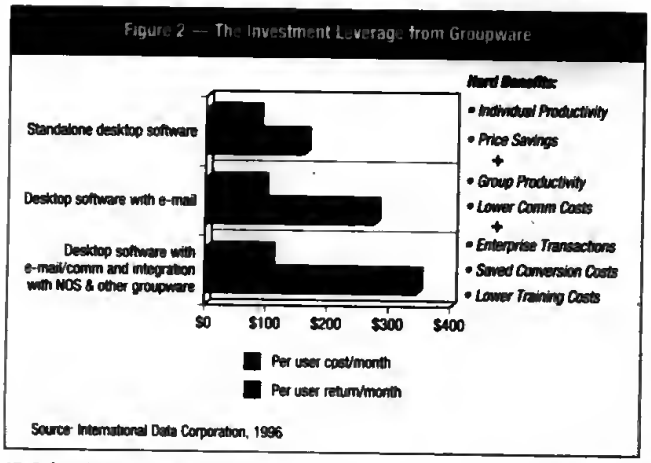
50% increase in users supported by a single server

ManageWise:

$95,784 savings in business efficiency per 100 users

50% reduction in network downtime

19.7 day payback



IDC found three areas of networked computing that are focal points for ROI leverage:

1. The choice and use of communication applications such as e-mail and groupware
2. The choice and use of next-generation network operating systems
3. The use of advanced network and system management tools

In addition, IDC found that when products in support of all three of these areas work together in an integrated fashion—such as Novell's GroupWise, NetWare 4.1, and ManageWise products—benefits are compounded. Support and training costs are lower, conversions and upgrades occur faster, applications come on stream sooner, and downtime is reduced.

Applications for the Next Wave

The migration to client-server computing is a quest to provide users with access to information and computer resources beyond their desks. One of the key tools for this is groupware software, epitomized by Novell's GroupWise, software which integrates e-mail with scheduling, calendaring, and other workgroup oriented functions. The market for groupware is exploding as organizations find they can use it—specifically the e-mail function—as a platform for providing workgroup and even enterprise-wide access to information and resources.

In the research IDC conducted, almost half of the business benefits organizations received from migrating to groupware came from better internal and external communications. For instance, Farmland Foods, a $2 billion dollar meat processing company, found that since installing GroupWise, documents once faxed in 15 minutes now take less than five to e-mail. Further, the use of GroupWise saved almost $400,000 in voice phone calls a year.

Figure 2 illustrates how electronic communication and collaboration generate cascading benefits. Standalone desktop software can impact individual productivity, but when combined with e-mail, that software can improve the productivity of a whole workgroup, not just the individual user. If the e-mail is specifically designed to work with the desktop software and with the network software, as say Novell's GroupWise is with NetWare 4.1, then those workgroup benefits are compounded.

This efficiency pays real dividends. When Sheppard, Mullin, Richter & Hampton, a Los Angeles law firm, made the move to GroupWise it found the support ratio for lawyers dropped from one assistant for every two lawyers to one for every three. GroupWise scheduling cut countless hours in tasks as routine as setting up meetings; GroupWise e-mail cut courier costs by $16,000 a year.

For most companies, an investment in groupware is considered an incremental cost. The hardware is already in place, as is the network. Moreover, the support costs—which account for more than 50% of the cost of operating a networked PC—are shared across dozens of applications.

But even with all the hardware, network, and support costs amortized across the groupware software, it's a bargain. IDC's research with Novell's GroupWise customers found that a typical installation required only about $250 in fully-loaded first-year costs—less than 5% of the annual cost of operating and supporting an end-user personal computer.

For that $250 investment, those same GroupWise customers found that their first-year return was over $800 on lowered communication and clerical costs alone. Meanwhile, they accrued an array of other concrete benefits, such as fewer meetings (and thus less travel and meeting administration), easier document handling, and so on. For every single GroupWise customer interviewed by IDC, return-on-investment exceeded expectations.

Modernizing the Network

If the LAN is the heart of client-server computing, then the network operating system is its soul. As LANs have evolved from peripheral information systems to the primary components of mission-critical systems, they have become more robust and more scalable. Along the way they have also provided IS personnel with the tools to manage network resources as never before.

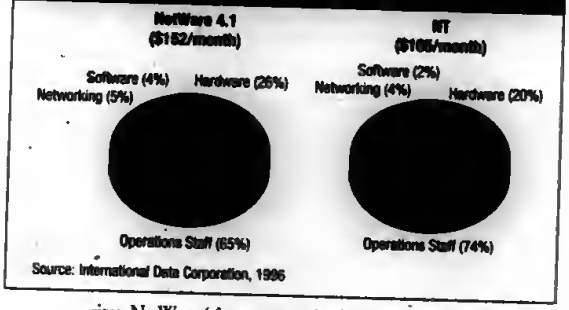
In fact, powerful new management capabilities are why many people are migrating to NetWare 4.1. With more than 375,000

licenses installed worldwide as of 1995, it is the most popular network operating system. Three key reasons for its popularity are:

- Greater functionality
- Improved management
- Directory services

Figure 3 illustrates how survey respondents believe migrating to NetWare 4.1 has enhanced network productivity—with ease of administration at the top of the list, mentioned by nearly 40% of respondents. NetWare 4.1's greater functionality has promoted companies' reliance on LANs and delivered on the ultimate promise of client-server—increased productivity.

Figure 4 — Network Cost to Use at Medium (300 User) Site
(Costs After Migrating from NetWare 3.x

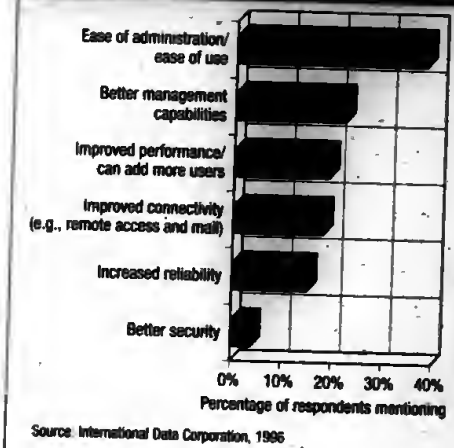


Source: International Data Corporation, 1996

According to recent surveys conducted by IDC, LAN managers report remarkable improvements in managing their networks under NetWare 4.1. Although they expected the number of nodes on their networks to grow by 260% in the 12 months following installation, they anticipated the number of file servers on the network would grow by only 163%. In other words, under NetWare 4.1, they expect to increase the ratio of users per server from 41 to 60—an improvement of 50%.

In addition to increasing the number of users per server, NetWare 4.1 provides a single point of administration with Novell Directory Services (NDS) that results in a lower cost of network administration. Figure 4 shows how, in medium-sized sites, NetWare 4.1 generates 14% lower network administration costs than Microsoft NT, primarily by increasing the user to support staff ratio.

Figure 3 — How NetWare 4.1
Improves Network Productivity



Source: International Data Corporation, 1996

Novell and other networking companies have set their sights on developing new technologies that will make tomorrow's networks more efficient and flexible. Novell has developed a Smart Global Network strategy, which entails making the network available to anyone—anytime, anywhere. An essential component of the Smart Global Network is Novell Directory Services (NDS), which enables companies to keep track of and connect all of a network's users, workgroups, hardware and software on one common access and administrative framework. NDS provides directory services technology that can handle the management of countless resources on heterogeneous systems spread around the globe. Also fundamental to Novell's vision of the future is an open set of application programming interfaces (APIs) that will make it easy to incorporate NDS and other NetWare 4 networking services into distributed applications.

Providing End-to-End Network Management

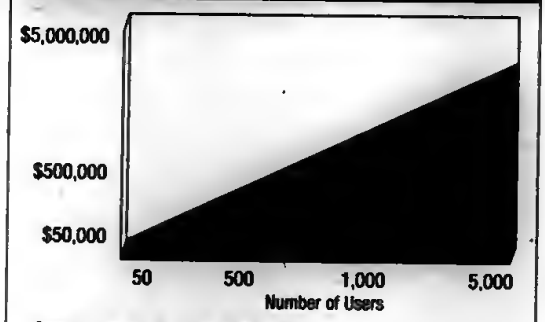
Staffing costs and end-user productivity are the issues that keep IS managers awake at night. And that has never been more true than it is today. As networks expand and intertwine, the critical success factors for network managers will include:

- Increasing network uptime, both in operation and when installing new users or applications
- Increasing efficiency by supporting rapid network growth without commensurate growth in staff
- Increasing responsiveness, fixing problems in a way that minimizes idle time for users or within business processes

To meet these needs, Novell offers ManageWise. It combines both network management and PC administration into a single, integrated package. Previously, most PC administration and LAN management products worked independently of one another, each requiring dedicated staff and resources.

ManageWise is the integrated solution that offers a single view of the network. It provides analysis tools for understanding bottlenecks; permits the configuration, inventory, and diagnostics of PCs from a single local or remote site; and provides tools for monitoring and managing remote and local servers. IDC's research demonstrates that even small and medium-sized companies can achieve significant cost savings by implementing ManageWise (see Figure 5). Network managers found that the most significant gains in efficiency were realized in server operation and help desk functions. Using ManageWise also increased LAN manager responsiveness. Before implementation, only 30% of network or end-user problems could be solved from a central site; afterwards, that number rose to 60%. This is especially important for companies with highly decentralized operations.

Figure 5 Average Annual Savings From ManageWise



Source: International Data Corporation, 1996

Since the software-licensing, maintenance, and training costs of a product like ManageWise are low compared to the number of users potentially affected, the return on investment can be surprisingly high. Across the survey base polled by IDC, ManageWise paid for itself on average within 19.7 days.

For every 100 users, implementing integrated management with ManageWise saved $95,784 annually. These savings are attributable to the following:

- More efficient systems management, including an increase of 33% in the number of servers and 25% in the number of PCs a staff person can support, and a decrease in travel of 53%, leading to annual cost savings of $14,500
- Significant reductions in the time required to perform key management tasks—such as five hours in moves and changes, nine hours in server maintenance and configuration, seven hours in help desk and support, four hours in problem tracking, three hours in printer maintenance, etc.—saving $30,844 annually
- Dramatic reductions in network downtime (over 50%) due to network outages, delays addressing problems at the desktop, or time spent installing and configuring applications, generating annual savings of $50,440

Cost-Savings and Client-Server: They Aren't Mutually Exclusive

Believe it or not, return on investment in networking can be quantified. While it may sometimes seem that networks are growing out of control, vendors like Novell are in fact working diligently to develop products for simplified, easily managed local, wide-area, and global networks. Because of the strategic and financial advantages of networking wherever systems reside and users roam, organizations will be forced to expand the reach and complexity of their networks simply to remain competitive.

Astute companies will concentrate on migrating to client-server computing in ways that maximize both the resources available to run networks and the effectiveness of those who ultimately generate revenues and profits—namely, end users.

Call to Action

This is an executive overview of a three-part series of White Papers entitled:

- **Novell GroupWise: Leveraging Desktop and Network Investments**
- **Novell NetWare 4.1: Reducing Cost of Ownership**
- **Novell ManageWise: Maximizing Returns on Networking Investments**

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461-000480-001

In the living room, an Internet consultant — laptop in tow — shows off his new wireless modem.

In the balcony, those who can stomach second-hand smoke are rewarded with a spectacular view of San Francisco Bay and may be privy to details of a forthcoming software product, a Silicon Valley start-up or the latest thing to take San Francisco's multimedia gulch by storm.

Upstairs, among the black knobs, buttons, dials and wires that fit every inch of wall space, technology journalists, musicians and artists jam on a variety of instruments.

Photos by Sima Aminzadeh

welcome to the

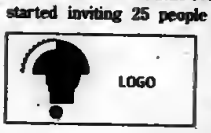
CYBERSALON

by lisa picarille

Every six weeks, Fred Davis, a veteran computer journalist and author, and Sylvia Paull, a former high-tech marketing executive who's now a freelance computer journalist, invite 200 people — 70 to 100 show up — to their Berkeley, Calif., home to discuss the issues that confront society as computers and technology become more pervasive.

The discussions have been going on since April 1994. Past topics include computers in education, sex in cyberspace, women on the Internet and intellectual property rights of artists who publish on the 'net.

Davis and Paull borrowed the cybersalon idea from a friend who's a high-tech analyst in New York and his wife. A little over two years ago, they started inviting 25 people to their apartment, charging them $30 each, feeding them a nice dinner and discussing social issues related to computers. That cybersalon broke up when the couple split: She got all the chairs in the house.



Davis and Paull, who have a huge circle of work-related friends, liked the cybersalon idea and started a similar discussion group. But they wanted a broader mix of people and thought $30 was "just too much for some poor hacker to pay," Davis says.

Instead, they request $10, $5 for kids. For that price, guests get tons of finger food and drinks and, most important, the chance to interact in a casual setting with those who influence the industry.

The crowd includes an eclectic mix: high-tech journalists and trade press reporters, multimedia programmers, Internet consultants, Apple Computer, Inc. product managers, computer book authors, venture capitalists, software developers, hackers, cyber-wanna-bes, hipsters, self-proclaimed geeks, job seekers, lawyers, artists, musicians, kids and Davis' oft-visiting relatives.

Industry heavyweights mix in easily. At one cybersalon, Mary McLuhan, daughter of legendary media critic Marshall McLuhan, brought a cyber-twist to her father's theory that the medium is the message. Marc Canter, founder and former CEO of Macromedia, Inc., a multimedia company in San Francisco, is cynical and opinionated enough to let attendees know how the business of doing business in Silicon Valley can squash truly creative ideas. And Dave Winer, a software developer and online journalist (his "Amusing Rants" column is read by Bill Gates, virtually every top Apple executive and a huge roster of other heavy hitters), is a cybersalon staple.

But Davis and Paull expand the discussion beyond the digerati. Once a topic is decided on, they contact people outside the computer industry. The most recent topic was computers and education, so they invited teachers, information systems managers in local school districts and lots of children.

Cybersalon, *page 85*

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60 Government - State/Federal/Local
69 Communications Systems/Public Utilities/Transportation
70 Mining/Construction/Petroleum/ Refining/Agriculture
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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CYBERSALON

CONTINUED FROM PAGE 81

The debates are often heated. Several cybersalons have degenerated into shouting matches. One discussion about the role of women on the Internet was halted for a brief cool-out after a staunch feminist referred to a well-known software developer as Newt Gingrich. The discussion took an intellectual nosedive, and nasty personal barbs and unprintable words flew.

Questions never really get answered. In fact, the discussions just seem to raise more questions. Paull likes it that way. She runs the discussion with an iron fist, cutting off drones and pushing people to clarify and elaborate. She challenges guests' opinions, plays devil's advocate and makes sure everyone with something to say says it.

While the discussion is what draws people, it typically lasts only two hours or so. The rest of the evening is for schmoozing, an essential part of the cybersalon experience. During the eight-hour affair, snippets of high-tech small talk swirl throughout the sprawling house.

When 80 individuals, all passionate about computers, sit in the same room, there are bound to be disagreements. Most come down to politics. How do we get computers into the hands of everyone, not just those who buy their way into the digital revolution, without involving the government? How do we protect the rights of artists, musicians and content developers without trampling the civil rights of others? How do we improve online security without imposing censorship?

Upstairs, guests mix in a small office packed with acoustic guitars, tambourines, digital drum sets and a huge two-tier synthesizer. One brave soul attempts to coax sounds out of a strange triangular black box. Others are afraid to touch the instrument, which turns out to be called a Zendrum and, of course, has a computer chip in it. All are encouraged to touch, play and participate.

If you can balance listening with a little self-hype, you might get in on one of the many deals being made on one of the home's three decks. Davis presides over the upper floors of the house, moving easily among musicians and constantly chatting with guests about a stream of dream projects. His latest is about to come true: San Francisco Mayor Willie Brown just signed off on Davis' plan for a 90,000-sq.-ft. San Francisco Computer Museum. Several cybersalon guests have volunteered to help with the nonprofit project.

And in what would be the musty basement of most homes are an airy white office and a TV room. People gather around several computers (there are nine throughout the house), gazing at whatever is on-screen. A young programmer/artist demonstrates a psychedelic screen saver. The creator left his job at a small software company to pursue "his own thing" and hooked up with Davis and Paull. He uses cybersalons to showcase his work.

Others, such as Tony Bove, a desktop publishing and multimedia analyst, have also given attendees peeks at their works in progress. Bove, a longtime fan of the Grateful Dead, showed off his pet project: a CD-ROM history of the music, mood and mystery of Haight Ashbury during the 1960s.

Down a flight of stairs, the newly remodeled kitchen and sparse dining room buzz with people munching on pizza, Chinese food and cookies. Most guests seem at ease, smiling while they sip wine and talk passionately about cyberstuff.

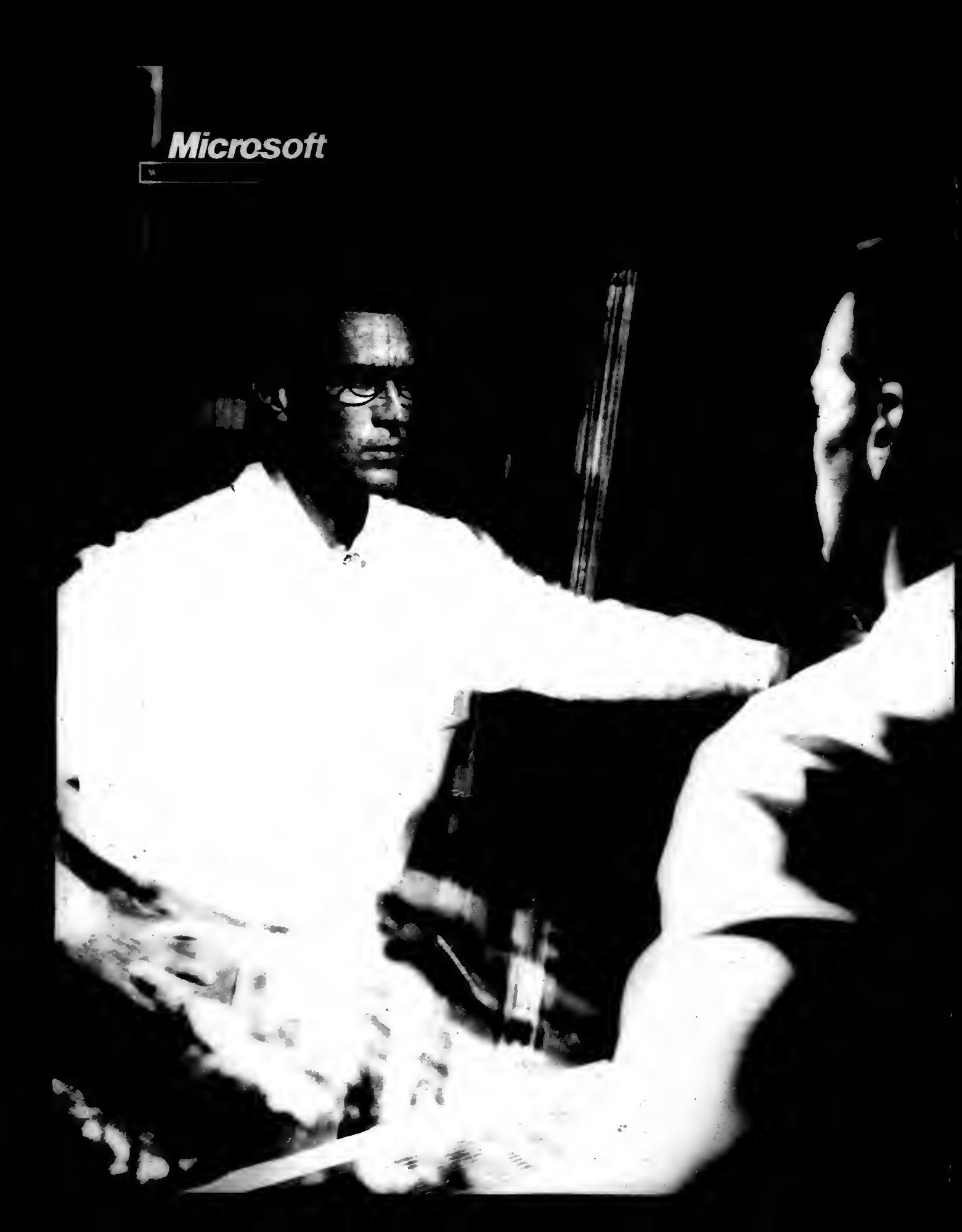
The formal discussion kicks off when Paull (standing) gathers everyone in the living room. She prompts them to introduce themselves and talk a little about why they're attending and what they hope to get out of the salon. It's like a weird cyberholic 12-step meeting: "Hi, my name is Bob. I'm an Internet consultant, and I want to know how Java can help kids get a better understanding of the world."

Although these gatherings are all about sharing ideas, communication and networking with others, there is inevitably a wallflower who feels most comfortable interacting with a computer. That person can usually be found sitting in the server room (it used to be the laundry room) surfing the 'net, checking out cool World Wide Web sites and occasionally turning around to say, "Hey, man, how's it going?" to someone opening the extra refrigerator in search of a beer. ■

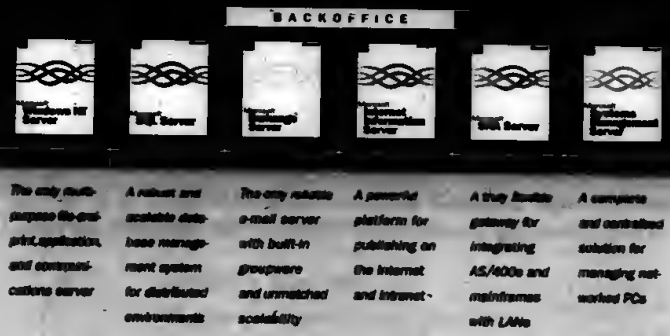
Picarille is *Computerworld*'s senior editor, Apple and PC software.

Kids try to master the latest computer games — at full volume, of course — or lounge on beanbag chairs, transfixed by Jim Carey's rubber-faced antics in the movie *The Mask*.

Microsoft



No vendor can anticipate every solution you'll ever need. But one can accommodate them.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Job Satisfaction

Exclusive COMPUTERWORLD Survey

Information systems professionals are awash in a sea of strategic and technical change. But with senior management failing to take the helm, this is becoming a very rocky voyage. / **By Rochelle Garner**

IS adrift

Call him "Mr. X." Although he's a midlevel information systems manager at a Western gas and oil company, he feels as helpless as a castaway. He's been cut loose without a chart or even a rudder to steer toward his company's intended course. Strategic direction? Forget it. Technical continuity? As if.

Instead, he and his IS colleagues must contend with corporate admirals who view information technology as an enemy to be subdued. "They don't have any real compre-

IS adrift, *page 90*

I'm so-so excited

"Somewhat" is how most IS professionals describe their job satisfaction

	Very satisfied	Somewhat satisfied	Neither	Somewhat dissatisfied	Very dissatisfied
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Job Satisfaction

Exclusive COMPUTERWORLD Survey

IS adrift

CONTINUED FROM PAGE 88

hension of how to manage IS, how to fix problems or how to get the greatest value out of it," says Mr. X about the people who run his firm. "They don't trust anyone who does, really." Small wonder he doesn't want his name or company listed for the world to see.

Mr. X and his midlevel peers spend their days in a furtive game of survival. Its rules: Stay out of the fan's inevitable spray. "To survive in this place, you do what you've been directly assigned to do as well as possible. Never get sucked up into something that is someone else's responsibility," Mr. X says.

But don't be misled by the excessive joylessness of Mr. X's situation. Based on *Computerworld*'s Annual Job Satisfaction survey, he's an early manifestation of the frustrations experienced by all IS professionals. The survey results are based on responses from 553 IS managers and professionals. Most respondents said they enjoy working with IT, but their satisfaction level is declining.

Some reasons cited for that decline: little access to new technologies, challenging projects or strategic efforts; senior management incapable of creating a strategic direction and sticking with it; and a lack of understanding of IS' role in furthering shareholder value.

"I blame *Reengineering the Corporation*," says Sue Winsett, a data management analyst at Teledyne Brown Engineering in Huntsville, Ala. "Because of that book, it seems every time we turn around there are new rules and new departmental policies we have to figure out."

To be fair, co-authors Michael Hammer and James Champy aren't responsible for the wholesale chaos seemingly roiling through the nation's enterprises.

It's just that their recommendations are so hard to execute.

"There's no question that a lot of companies have mishandled business process re-engineering," says Michael Green, a principal at Treacy & Co. in Boston. "There were a lot of questions that weren't asked along the way, like 'What should we be doing?' and 'What is the value we are creating for our customer?' "

Too tough to take

Nearly all IS professionals feel stressed on the job . . .

	Very stressful	Somewhat stressful	Not very stressful	Not at all stressful
Senior IS executive	41%	55%	4%	0%
IS middle manager	30%	66%	4%	0%
IS staff	18%	66%	14%	2%

. . . and the stress level is rising

	More stressful	About the same	Less stressful
Senior IS executive	49%	43%	8%
IS middle manager	52%	36%	12%
IS staff	45%	41%	14%

Those were the days

The levels of job satisfaction are declining

	Increased	Stayed the same	Decreased
Senior IS executive	30%	38%	32%
IS middle manager	29%	31%	40%
IS staff	27%	34%	39%

Norman Coulombe

Looking for direction

Janice Knight has seen firsthand the benefits of such answers. As an information resource coordinator for Orange County, Fla., Knight must translate the county's overarching strategic direction into a five-year tactical plan. Two years ago, when Knight joined the county government as chief information officer, there was no strategic direction. The IS organization felt aimless. But last year, the chairman of Orange County devised a strategy dubbed Citizens First.

"Those two simple words, 'Citizens First' — boom! — hit everyone," Knight says. "With it, people instinctively could look out across their desks and know why they were there. I thought it was brilliant."

It is brilliant because the catchy phrase has real meaning, unlike the many platitudes and mission statements employees have suffered through. Citizens First means that — from writing code that makes it easier to get a building permit to speeding mental health benefits — Orange County's IS department can finally chart a meaningful course.

The result has been electrifying. "In the two years I've been here, I've seen us go from a large strategic void to having a rallying cry that unites all of the people in the county government," Knight says.

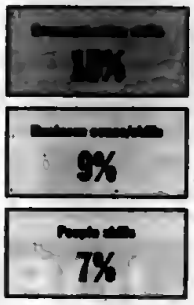
That's what a meaningful strategic direction can do. Equally important, analysts say, is that direction must remain consistent.

"Years ago, people held the view that the best management style was the most predictable," says Quinn Spitzer, CEO of Kepner-Tregoe, Inc. in Princeton, N.J. "I think it's still true. The companies that are always listed as the most enjoyable workplaces are also the ones with fairly constant approaches to how they manage the business."

Small wonder, then, that the lack of a consistent strategic direction troubles so many *Computerworld* survey respondents. Even those who describe themselves as "very satisfied" to "somewhat satisfied" revealed a yearning for consistent sailing orders.

What are you trying to say?

IS professionals say their supervisors most often lack:

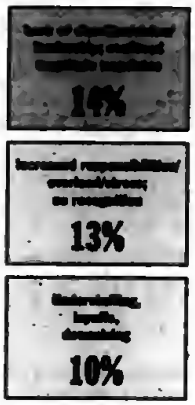


Dead in the water

An all-too familiar complexity now vexes the lives of IS professionals and others in today's corporations. As companies change their business processes, they create a corporate climate that's disconcertingly uncertain and difficult to manage.

What do you want from me?

More work and less direction most often haunt IS professionals



One such middle manager is Charles Hughes II, a vice president and MIS audit manager at Rochester Community Services Bank in Rochester, N.Y. He says he likes his work, job and colleagues. He likes his bosses, too, but wishes they had a better grasp of what they want to do with technology.

"It's middle management driving technology decisions, with the support of senior management," Hughes says. "The challenge is for the senior level to have the vision and the confidence to say, 'This is where we want to go.' "

One example was when two significant projects were under way for two major business units within the holding company that oversees the Rochester bank.

"Even though they were built at the same time, those projects used different technologies and different approaches — with the result that any corporate sharing of information between those separate units will be more difficult," Hughes says. "The development decision was driven by what the business units wanted rather than by a strategic decision coming from the corporation."

"That creates a huge burden on midlevel managers," says Neil Chernoff, a vice president at CSC Index, Inc. in San Francisco. "The high-level people have a basic idea of what they are trying to accomplish. Their sense of satisfaction comes from picking the technology and feeling that they made the right strategic decision."

And the people below have the high-pressure task of trying to make the stuff work.

An IS professional, who feels highly stressed and uncomfortable with being named, describes 80-hour work weeks and teeth-grinding responsibilities. "There's a lot happening in this industry, and information technology is a major part of competing in this business," he says. "The pressure is always there. We are always on the critical path for the next stage of development. People are always depending on me."

It's a recipe for a sense of powerlessness that comes from too many fires and too little direction. And in fact, the latest satisfaction questionnaire is filled with comments that reflect respondents' lack of control.

"No decision-making responsibilities," writes one disgruntled worker from the professional ranks. "Too much is expected from too few."

"Not enough time to do a good job," writes another, who cites "unrealistic deadlines" as a source of pressure.

"Politics take time and energy away from the real job," a third complains.

And as companies continue to contract with outsiders to handle certain aspects of the IS function, such as operations or development, that feeling of helplessness is likely to increase.

"The lower levels will continue feeling unempowered and undirected, which is what comes from having outsiders telling you how to do your jobs," Green says.

It hardly seems fair — especially considering that the top source of gratification for all IS professionals is working on advanced technologies.

"My greatest source of satisfaction is cutting-edge projects," says Mark Walde, data processing manager at Muscatine General Hospital in Muscatine, Iowa. "That's why I'm in this field."

There's a paradox here because even as companies ramp up exciting projects for client/server, the World Wide Web and fast information access, a relatively small portion of an IS group gets to have fun with the new toys.

"Probably 20% to 25% of an IT organization gets exposed to those new technologies, and the remaining 75% have to maintain the in-place legacy systems to run the business," says Gene Raphaelian, vice president of management strategies and directions at Gartner Group, Inc.'s Bay Area Research Center, in Santa Clara, Calif.

So only a small portion of the IS population gets technological gratification? Most analysts say yes. But not Jim Bair. The Gartner research director sees new opportunity to do the kind of work that makes an IS heart go pitter-patter.

"That's particularly true with the Web — a phenomenon that's happening too fast to set up a contract with a systems integrator or any kind of consultant," Bair says. "These are opportunities for new and exciting things for IT professionals to do. And the Web is happening so fast that you can almost view consultants as having lost their edge."

The point of all this? Life for the IS professional doesn't have to be as drab as it is for poor Mr. X. But chances are, it won't be all sweetness and light, either.

Times are changing. Our expectations will have to change, too. ■

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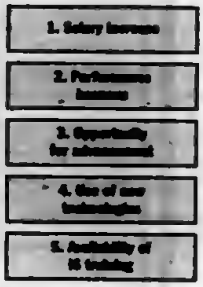
Satisfaction wish lists say money can buy happiness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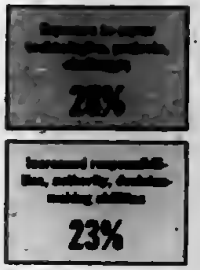

I feel so uninspired

Most IS professionals don't feel they're working to their full potential

	Yes	No
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IS middle manager		
IS staff	34%	66%

Garner is a freelance writer in San Carlos, Calif.

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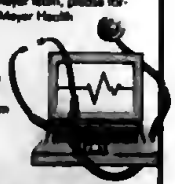

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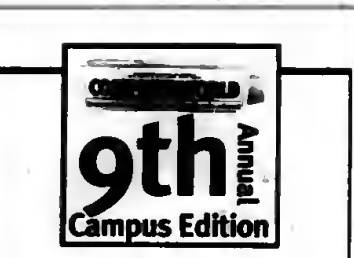

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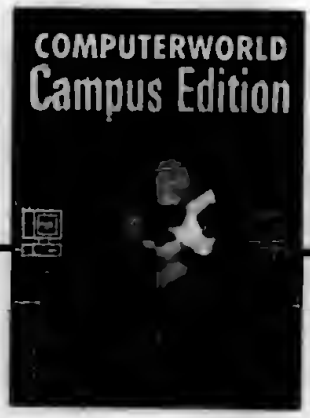

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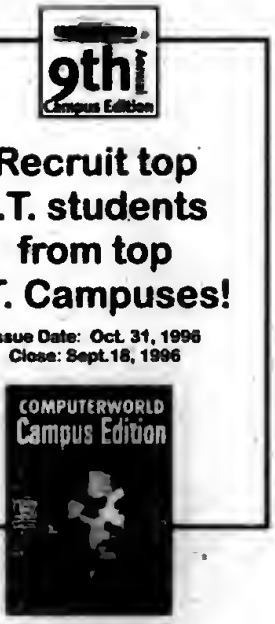

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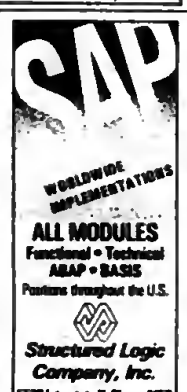

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C, C++, Smalltalk, DB2	UNIX, NT & Windows Admin.
UNIX, NT & OS/2	Technical Writers
Object Methodology, GUI	Hardware Technicians
Lotus Notes	Software Technicians
PowerBuilder & Visual Basic	Help Desk Support Specialists

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TULSA

UNIX System Administrators 1-3 yrs in a SUN/AIX operating system environment. Proficiency in UNIX installations/upgrades, shell scripts and TCP/IP networking. Network performance tuning and C programming language preferred. SP/2 a plus.

Oracle/UNIX DBA 2+ yrs Oracle/UNIX relational and object oriented DBMS. Experience with premise-related operating system SW (UNIX, SVR4, AIX, OS2 or VOS) a plus.

VM Systems Programmers 2+ yrs as a VM Systems Programmers. Strong diagnostic skills required.

MVS DASD Administrators In-depth knowledge of SMS, HSM, DMS, DFDSS, FDR, ICKDSF, tape and silo strategy, TMS, TMM, programming techniques, PL1, Easytreve, defrage, catalog mgmt, DASD performance tuning, and/or DASD software tools required.

TPF Database Manager Leadership of development projects and support activities. Responsible for all database activities including Recoup, Pool Directory Update, Face Tables, Global Record Tables.

TPF Coverage Programmer 3+yrs TPF development. Maintain integrity of TPF-based SABRE system & multiple UNIX based systems such as SAP. Assembler and/or C programming required. Expertise in TPF Coverage, TPF dump analysis, and TPF version 4.1 preferred.

Project Managers 3+yrs project mgmt experience on large-scale projects and a knowledge of formal project management practices and SW development methodology preferred. Expertise in Client/Server, UNIX, MVS, TPF Mainframe and Connectivity desired. Formal PMP certification a plus.

IMS DBDC DB2 DBAs 3+yrs IMS DB/DC and DB2 Data Base Analyst experience required. Oracle/VMS and TERADATA preferred.

Technical Specialist Test, service, repair and install computer equipment. Troubleshoot communication-related problems. Knowledge of CCI, Digital, IBM, TERADATA, or STK desired.

DALLAS

LAN Architect Hardware Design required.

ORACLE Data Base Administrator 2-5yrs ORACLE 7 DBA on UNIX. Prefer production database support experience w/ backup &recovery planning, implementation, performance monitoring and tuning desired. Knowledge of Solaris a plus. Opportunity to cross train in UNIX System Administration.

E-Mail Specialist Experience w/SMTP, X.400/X.500, Novell IPX/SPX, HP/UX, and SendMail. Knowledge of HP OpenMail, Lotus Notes, Groupwise, IMS & Internet Mail, X.25, CC:Mail, and/or Worldtalk a plus.

Communication Engineer - CNE Expertise in Sniffer &/or Lanalizer, decoding protocols and packets, TCP/IP, Cisco Routers, SNMP, and IPX/SPX/Appletalk preferred. Knowledge of 10-Base-T Hubs, Concentrators & Switches, Macintosh, Cisco Works, Sun Net Manager, Netview, HP Openview, UNIX, Network Design &/or Cabletplant defined.

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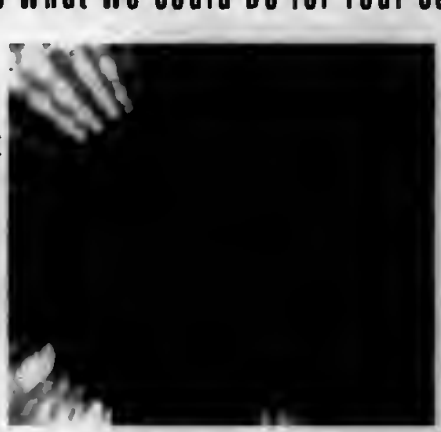

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At SHL, an MCI company, our professionals are busy showcasing their considerable entrepreneurial talents and analytical skills on five continents for a diverse Fortune 500 client base resulting in over $1 billion in sales annually. When you think about it, it's really no surprise that top professionals in the computer services industry have decided to join SHL. What about you?

CLIENT/SERVER PROFESSIONALS

Currently, we are seeking Developers through Architects, Project Managers and other seasoned individuals with a solid Client/Server background. We are also seeking individuals with working knowledge of:

- PowerBuilder
- RDBMS
- Oracle Financials
- Microsoft Exchange
- NeXTStep
- SmallTalk
- PeopleSoft
- Forte
- Novell
- Windows NT

A partial listing of the applications we seek includes:

- Global Telecomm/Network Management
- OOAD Methods
- Object Oriented Programming
- Distributed Object Architectures
- Object Data Management
- GUI Development
- Call Center Support
- Help Desk
- Internet/Intranet

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Engineering

Software Engineers - Will have excelled in a professional software development organization coding in Pascal, C, PL/I or IBM ALC in an IBM mainframe environment. Working experience with MVS/TSO/ISPF, DB2, IMS or IDMS applications using PL/I is a plus. **Phoenix Location.**

Customer Support Software Engineers-Interact with customers worldwide to resolve technical problems with VIASOFT state-of-the-art COBOL software products. MVS programming experience in COBOL, PL/I and/or ALC. Working knowledge of MVS JCL is required. Customer Support experience with a software vendor is a strong plus. **Phoenix location.**

Consulting and Education

Software Consultants - Various levels dependent on ability to deliver customized solutions in highly visible scenarios. Provides analysis of century/date conversion issues and develops strategic initiatives for incorporating legacy systems in contemporary computing architectures. Previous experience with programming languages is required along with IBM MVS mainframe experience. Typically 3+ years experience in application development/maintenance and consulting. Bilingual skills preferred. **Nationwide locations.**

Education Consultants - Ability to deliver customer and internal training on VIASOFT technologies and processes. Seeking 2+ years in adult technical education, preferably teaching computer software subjects related to MVS environment. Includes knowledge of programming languages (i.e. COBOL, TSO, ISPF) and the ability to develop and manage project plans.

Provider Consultants - Ability to manage large scale projects of 3rd party providers with proven customer results. Seeking 7+ years as an IT rep in a consulting and/or sales capacity to include excellent communication and presentation skills. Must have previous knowledge of mainframe computer software. Travel required. **Nationwide locations.**

Sales, Marketing and Support

Account Managers and Federal Account Managers - Ability to influence the decisions and sell technology and service solutions to senior IT executives or federal entities. 5+ years proven software industry sales track record with experience selling mainframe computer software and consulting services. Working knowledge of PC skills (e-mail, word processing, spreadsheet). **Atlanta, Minneapolis, Ohio, Pittsburgh, St. Louis and Washington D.C. locations.**

Product and Solution Marketing Managers - Ability to develop marketing strategies, product requirements and collateral, integrating products and services in a solution for potential clients. Requires strong software marketing experience with knowledge of COBOL/MVS systems and/or distributed computing architectures.

System Engineers - Technical support for pre-sale activities and post- sales maintenance support. 3+ years previous COBOL programming experience in an MVS, TSO/ISPF environment, including one or more of CICS, IMS/DC, PL/I, Assembler, DB2, or IDMS. Strong sales orientation and willingness to travel up to 80% of the time. Spanish bilingual skills a plus. **Nationwide locations.**

Send resume noting specific job of interest to our Corporate Office: **Human Resources-CW1, 3033 N. 44th Street, Suite 101, Phoenix, Arizona 85018, FAX 602/840-4064, or via E-mail: careers@viasoft.com. See our Homepage at: http://www.viasoft.com.** EOE-M/F/D/V

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Consultant, 40hrs/wk., 9am - 5pm, $42,000/yr. Design & develop software for management information systems. Propose enhancements & new features for existing software. Analyze, write & execute test scripts. Software quality assurance. Tools: PVCS Tracker; MKS; RCS; CC Mail; SQL Teamtest; MS Visual Basic; Visual C++; Excel; MS Access; Windows NT Server; Windows for Workgroups; SQL Server. *M.S. in Computer Science as well as 3 mos. experience in job offered or as Software Engineer required. *Completion of all coursework is acceptable in lieu of M.S. Previous experience must include: C++; Visual Basic; functional verification; writing of test procedures; MS-Windows; real-time embedded systems. Must have proof of legal authority to work permanently in the U.S. Send two copies of cover letter & resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Mary Miller, Reference #V-IL-14887-M. NO CALLS. An Employer Paid Ad.

Database Administrator - client site in Muscatine, IA, minority of time at client sites elsewhere. Review proposed changes to physical database, establish parameters; develop data warehouse; specify user access; undertake performance testing; implement back up & recovery procedures; modify programs; use MS-Windows, Visual Basic & either Informix, Oracle or SQL Server. Bachelors/Comp. Sci or Engg or Math. 1 yr/exp. in job offered or 1 yr as Prog/Analyst &/or Systems Admin or any comb. thereof. Must be willing to travel & relocate as needed (reimb. by employer). Exp. in job offered or related occ must incl. prev. using MS-Windows, Visual Basic & either Informix, Oracle or SQL Server 40hrs/wk (9-6), $43,500/yr. OT as needed @ $20.91/hr. Must have proof of legal authority to work in the U.S. Send your resume to D.E.S. Workforce Center, 2213 Grand Ave., Muscatine, Iowa 52761-5650. Please refer to Job Order # IA1100505. Employer paid ad.

TPF/SYSTEMS ENGINEER required. Design/code changes to the MVS & VM/CMS library using TPF (TPF 3.1 and/or TPF 4.1) & CMSTPF. Coordinate system activities on TPF Control Program upgrades including design/coding of utilities to support upgrades. Develop communication functions of support for CRS systems including message switching packages & database communications software to real-time. Applications analysis, design, coding & implementation using knowledge of TPFDB, TPF Dump Analysis, Assembly, SPM & Structured Design/Analysis methodology. Four years experience required in the job duties described above. Must have proof of legal authority to work in the U.S. Salary-$60,000/year for a 40 hour work week. Interested applicants apply in person or send two resumes to: Georgia Department of Labor, Job Order #GA5680414, 2636-14 M.L. King Jr Dr., Atlanta, GA 30311-1605 or the nearest Department of Labor Field Service Office. Ad employer paid ad.

ANALYST PROGRAMMER required. Design & development of customized data management solutions & database applications on UNIX, DOS & VAX/VMS platforms using Informix 4GL, SQL & Clipper. Provide connectivity by integrating Novell Netware with TCP/IP networks in an Ethernet configuration. Design User interfaces, serve as Network Administrator & maintain network security including automated backup procedures & software version control. Two years experience required in the job duties described above. Must have proof of legal authority to work permanently in the U.S. Salary-$45,000/year for a 40 hour work week. Hours-8:00 a.m. to 5:00 p.m. Interested applicants send resume to: Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, IL 60605. Attention: Lori Bokes, Reference #V-IL 15427-B. AN EMPLOYER PAID AD. NO CALLS-SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

INFORMATION SYSTEMS INTEGRATOR required. Support & implement various network technologies including IPX & IP, perform LAN management, & provide diagnostics, connectivity & consulting solutions for PC, Macintosh, UNIX & Mainframe users. Provide LAN based security using JRB Utilities & SYSCON & mainframe security using RACF & other utilities. Administer & support Novell Netware, multi-site email systems & multi-site, multi-server backup solutions including use of utilities Arcserve 4.1, Arcserve 5.1 & others. Provide support for Internet technologies including Remote Login, Telnet, FTP, WWW, & HTML. MBA or its equivalent required in Management Information Systems or related curriculum, plus 2 years experience in the job duties described above. Must have proof of legal authority to work in the U.S. Salary-$55,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to the Texas Employment Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. JO #TX7506298. Ad Paid by An Equal Opportunity Employer.

Consultant/Software Engineer, 40 hrs/wk, 8am-5pm, $54,100/yr. Design, development, testing & maintenance of signaling system & protocols for communication modules. Network device driver development. Real time embedded system development. Tools: MGTS, UNIX, C/C++, Assembly. TCP/IP, SS7, pSOS, X.25 protocol. MS in Computer Science as well as 1 yr exp in job offered or as Consultant required. Previous exp. must include: network device driver development; real-time embedded system development. (Graduate education must include 1 project each on distributed queuing random access protocol, SS7 protocol & X.25 protocol. Must have proof of legal authority to work permanently in the U.S. Send two copies of both resume and cover letter to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Sheila Lindsey. Reference #V-IL-15299-L. NO CALLS. An Employer Paid Ad.

Database Administrator & Developer, 40hrs/wk., 8am - 5pm, $40,000/yr. Development, monitoring, support & administration of cross-functional multi-user Sybase-Sun data warehouse being developed as part of a client/server Integrated Reporting Facility (IRF) System security & quality assurance. Programming for data transfer & database operations applications. Tools: Sybase, UNIX, TCP/IP, CASE tools, SQL, ESQL, NFS, C/C++, GUI. M.S. in Computer Science as well as 1 yr. experience in job offered or as Programmer Analyst required. Previous experience must include: relational database administration & design, SQL, ESQL, UNIX system administration, TCP/IP, NFS network, C/C++, CASE tool, client/server technology, GUI. Must have proof of legal authority to work permanently in the U.S. Send two copies of cover letter & resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: James Gregory, Reference #V-IL-14487-Z. NO CALLS. An Employer Paid Ad.

SOFTWARE ENGINEER (2 positions) 40 hrs./wk., 8am-5pm, $52,000/yr. Carry out system analysis, system design, coding & testing of software applications to an IBM or ICL mainframe environment utilizing IDMS and COBOL. Req: Bachelor's degree in Computer Science, Electrical or Mechanical Engrng. and 4 yrs. exp. in job offered or 4 yrs. exp. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Req: work experience in development of applications in a mainframe environment utilizing IDMS & COBOL. Employer is S/W development/consulting firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. *Employer paid ad* E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref #94798.

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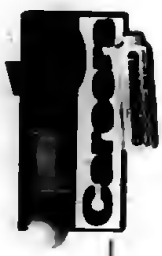

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A Bachelor's degree/equivalent work experience and thorough working knowledge of call center operations technology (ACD, PBX, IVR) are required. Along with excellent verbal/written communication skills, training, presentation and negotiation experience is needed. Call center management experience is desirable. 70-80% travel and customer interface will be involved. When not traveling, our Consultants work in a virtual office.

We offer excellent compensation and benefits. For immediate consideration, please send your resume to: **Lucent Technologies, BCS Call Center Staffing, 343 Sansome St., 10th Floor, San Francisco, CA 94104.** An equal opportunity employer.

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We have created a corporate culture that encourages the exchange of ideas and promotes internal networking through monthly dinner meetings, in-house classes, and a variety of social activities. Through our shared commitment for mutual growth, you'll have ample opportunity to develop the technical skills and business savvy to meet all your career objectives. Our team has thrived in an environment filled with vision, synergy, challenge, and is on the leading edge of advanced IT solutions.

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- RT Embedded, Intel 80960, VxWorks
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- NT Device Drivers, VxD
- UNIX Device Drivers, SCSI
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- COBOL, IMS, Seeptre
- Project Managers
- Data Modelers
- COBOL II
- ORACLE, DB Tools, Financials, CASE, Workgroups 2000
- DEC VAX COBOL
- ORACLE or SYBASE Developers
- Workstream
- Software Testers (MS Test, nice to have)
- PowerBuilder
- UNIX C or C++
- ADABAS/Natural
- ORACLE Pro C
- Business Consultants
- Visual C++
- MVS
- Prumas
- CELLWorks
- MS ACCESS
- IMS DB/DC
- SQL
- SAS
- Visual Basic
- GUI Tools
- RDBMS
- VAX/VMS

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Phone: 800/345-7782, ext. 327
FAX: 800/919-9951

If you are interested in opportunities with any one of our other offices, be sure to interact with CTG's World Wide Web page at: http://www.ctg.com Apply online for the Region Sourcing Center nearest you.

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SENIOR ENGINEER (2 positions) 40 hrs./wk., 8am-5pm, $50,000/yr. Carry out system analysis, system design, coding & testing of computer S/W systems for manufacturing applications in an IBM mvs/fm environment utilizing IDMS and COBOL. Req: Bachelor's degree in Computer Science, Electrical or Mechanical Engrng. and 4 yrs. exp. in job offered or 4 yrs. exp. in Systems Analysis &/or S/W Engineering &/or Programming &/or Computer Consulting. Req: work experience in development of applications in IBM or ICL mvs/fm environment &/with IDMS & COBOL. Employer is S/W development/consulting firm. Relocation to various client sites throughout the U.S. for periods of 6 mos. to 2 yrs. required. "Employer paid ad" E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. #64696.

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FAX: (914) 977-1888
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Associate Business Analyst to serve in systems development and participate in projects related to computer software development and maintenance for property and casualty insurance systems by providing detailed design specifications of business applications with emphasis on utilization of CASE tools such as SYNON/2E. Modify industry software WINS to cater to business requirements. Perform data mapping as per the business rules defined by business users. Assist in preparation of technical information/ documentation relative to on going systems administration and maintenance. Applications development will require use of AS/400 tools and utilities including CL, SQL, SDA, SEU and PDM as well as COBOL and RPG programming languages in AS/400 midrange environment. Requires Bachelor in Business Computer Systems or Computer Science with 6 months experience in the job offered or as a Programmer or Programmer Trainee or Assistant Business Analyst or any combination thereof. Applicants must have gained academic or professional experience in the area of AS/400 midrange implementation of WINS, as well as use of AS/400 CL, SQL, SDA, SEU, COBOL, mainframe COBOL and RPG. 37.5 hrs/wk, 8AM - 4:30pm-5pm, $32,480/yr. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of both resume & cover letter to Illinois Dept. of Employment Security, 401 South State Street-3 South, Chicago, IL 60605. Attn: Ruth Darnell. Please reference #V-IL 14090-R. NO CALLS. An employer paid ad.

Consultant, 40hrs/wk., 8am - 5pm, $40,000/yr. Design, development, implementation & testing of software applications for business clients. Database design. Client/server & object-oriented technology. Tools: CA/IDX, Paradox, Visual Basic, Powerbuilder, Informix, C++. M.S. in Computer Science as well as 6 mos. experience in job offered or as Programmer Analyst required. Previous experience must include: database design, UNIX, C, C++, Visual Basic, Powerbuilder. Must have proof of legal authority to work permanently in the U.S. Send two copies of cover letter & resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Janet Aschenbrenner. Reference #V-IL 15527-A. NO CALLS. An Employer Paid Ad.

SYSTEMS ANALYST (Sr. Principal Consultant) Implement, administer & solve complex problems relating to rel. d/b systems. Analyze, design & implement complex MIS strategies. Analyze clients Business Info. Flow reqs, formulate enterprise models, & design & develop custom applications using rel. d/b s/w & 4GL app. dev. tools. Lead project teams. Must have BSCS or equiv. education & exp. (w/ 3 yrs. of related exp. substituting for each missing academic year). 5 additional 5 yrs. exp. in rel. d/b design, analysis, or admin. Must know CASE method, modeling techniques, & must have working exp. w/ROBMS tools (like SQL*Forms, PL/SQL, etc.), CASE tools & OS (like UNIX, VMS). $5000/mo. Frequent travel. Home office/interview site in Boston. Submit 2 resumes to Case #60163, PO Box 8968, Boston, MA 02114.

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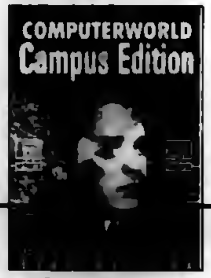

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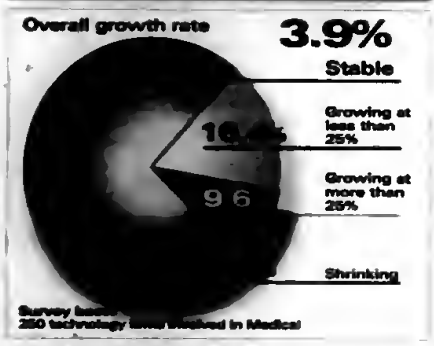

Survey conducted between February '96 and April '96.

Regional Growth Analysis

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Marketplace

Price chopping *brings* tough decisions

Buyers must choose between the low cost of Pentium and the power of the most expensive Pentium Pro

By Steve Alexander

Corporate buyers of desktop PCs are faced with a difficult choice. They can buy Pentium-based machines at today's attractive prices or wait several months for price reductions on faster Pentium Pro PCs.

Prices on desktop Pentium PCs are very appealing after a 25% decline in the past year. For example, last year's typical corporate purchase of a 90-MHz Pentium PC cost $2,589 but now costs only $1,483, according to analysts. A similar price reduction has brought prices for this year's typical corporate PC, the 133-MHz Pentium, to $2,200 to $2,500, down from $3,300 to $3,700.

Some analysts say prices won't drop as much in the coming year. From this year to next, price declines will likely be only 18% to 20%, a level that has been typical for several years, says John Dunkle, president of Workgroup Strategic Services, a market research firm in Portsmouth, N.H. The exception could be high-end prices, which may tumble as Intel Corp. aggressively pushes its new chips.

By late this year or early next year, some analysts expect prices for the 150-MHz Pentium Pro models to have declined from today's $4,000-to-$6,000 range to between $2,800 and $2,900. "I see Pentium Pro prices coming down by the first part of next year to above where the Pentium is now but close enough to attract some corporate buyers, those who buy at the front end of the technology curve," says Scott Miller, a senior analyst at Dataquest in San Jose, Calif.

So, should corporations buy Pentiums now or wait for lower prices on Pentium Pros? That depends on their applications and corporate direction, analysts say. "If you're doing word processing or spreadsheets, you're buying more for your buck in the Pentium family," Dunkle says. "But for those applications that can leverage a 32-bit application, such as financial modeling, CAD or anything numerically intensive, NT running on a Pentium Pro makes more sense — you get 25% to 40% more performance."

In addition, information technology buyers will need to consider whether their corporate strategies will require a move to NT. "If Windows NT becomes the prevalent operating system, which we expect, companies need to understand that they'll need Pentium Pro workstations because that chip architecture is optimized for true 32-bit applications," Dunkle says.

But because corporations have been slow to install 32-bit operating systems, Dunkle says the PCs they buy today will be used longer than the usual 24 to 28 months. Many corporations are still six to eight months away from fully deploying Windows 95 or Windows NT, he says.

But Miller disagrees that Pentium machines will stay on desktops longer. Instead, he predicts that Intel will push sales of Pentium Pro machines by making next year's models perform better with Windows 95. Miller says average corporate PC prices could increase this year because companies are buying fully equipped Pentium Pro machines. "I think average prices will go up slightly or stay fairly flat. The variable is the cost of [dynamic RAM]. We'll have to see how much farther it falls and how long price declines keep going," Miller says.

Added features and the lack of Intel-generated price cuts are two reasons year-to-year price decreases won't match last year's, Dunkle says. "PC manufacturers are quickly adopting third-party motherboards from Intel. As the Intel content in the box increases, those manufacturers will try to add value in other areas, and that means added cost to them." That is expected to slow price declines.

Another factor that may slow price cuts is that Intel is unlikely to repeat the mistake it made last year when it underestimated the lifespan of 75- and 90-MHz Pentium PCs, Dunkle says. That forced Intel to cut prices of its 133- and 166-MHz chips to stimulate demand. ■

Alexander is a freelance writer in Edina, Minn.

Oak

Plummeting prices

The dramatic price slashing of the past year has left managers with a Pentium vs. Pentium Pro dilemma

	1994:	1995:	1996:
120-MHz Pentium, 16M bytes of RAM, 1.5G-byte hard disk	NA*	$3,120	$2,191
90-MHz Pentium, 8M bytes of RAM, 1G-byte hard disk	$3,450	$2,589	$1,483
75-MHz Pentium, 8M bytes of RAM, 850M-byte hard disk	$2,698	$1,794	$1,107
100-MHz DX4, 4M bytes of RAM, 500M-byte hard disk	$1,898	$1,231	$984

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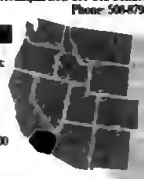

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Slow going for Stratus, 106

Next week: "The Motley Fool" Web site creator, David Gardner

Trading places

By Julie Bort

The boom in the high-tech industry has produced an unusual by-product: a war between the nation's two largest stock exchanges. In the wake of competition between the New York Stock Exchange and the Nasdaq Stock Exchange, high-tech companies — previously shunned as too unstable — have been elevated to the status of prize.

Nasdaq, once considered a synonym for "fledgling start-up," has blossomed both in volume and prestige as its top listers, including Microsoft Corp. (MSFT) and Intel Corp. (INTC), have prospered. In fact, last year, $2.4 trillion worth of stock was traded on the exchange, which hosts 6,000-plus companies with a combined market capitalization of $1.2 trillion. In comparison, the nation's oldest and largest exchange, the NYSE, saw $3.08 trillion worth of trades of its 2,675 member companies, which have a combined market capitalization of $6.01 trillion.

Although Nasdaq hasn't overtaken the Big Board, the portion of the market it trades is hardly trivial. The NYSE has responded by fishing for new listings from Nasdaq's upper echelon, which is almost entirely high-tech companies.

The NYSE sales program targets all eligible companies. "Within the Top 50 Nasdaq companies, there is a high concentration of high tech," says Cathy Kinney, group executive vice president at the NYSE. "We would like to have more high-tech companies [because] they are actively traded and they have high market caps." And with high technology dominating the initial public offering (IPO) market, "that's what's feeding growth for both the NYSE and Nasdaq," she says.

The NYSE offers enticements. First and foremost, it promises high-tech companies that its "auction market" will give the typically volatile stocks more stability. An auction market is where investors sell directly to one another, with specialists who oversee the transactions but are prohibited from trading. Specialists, therefore, "look after" a stock. For instance, they can halt trading if buying or selling imbalances occur, thereby preventing a stock's price from plunging without adequate cause.

In contrast, Nasdaq is a "market maker" system, meaning brokerages carry an inventory of stock from which investors purchase. For the investor, this middleman approach tends to lead to slightly higher stock prices, analysts say. On the other hand, it also means more stocks are researched and information becomes readily accessible to investors, which aids them in finding and choosing investments.

Listing on the NYSE also carries with it a certain level of prestige because it has the steepest requirements of any exchange. Companies must have an aggregate market value of at least $40 million, have an income of at least $2.5 million and offer at least 100,000 shares, among other qualifications. This prestige is often sought by high-tech companies looking to strengthen their image, particularly with foreign investors.

These lures have met with some success. Corporations have been moving from Nasdaq to the NYSE at a rate of about one per week, including such top high-tech players as Bay Networks, Inc. (BAY), which switched in February. For Bay, the move was one of prestige and practicality.

"We believe by being on the NYSE there is an overall benefit to the shareholders. The spreads between bid and ask tend to be lower. Also, the heart of our customer base is large customers. Being on the NYSE gives us more credibility with them," explains Bill Ruehle, chief financial officer at the Santa Clara, Calif., company. Bay is a major supplier of networking equipment to the NYSE, a fact that also had a lot to do with the decision, Ruehle says.

To be fair, the current migration represents less than 1% of Nasdaq's total listings, which are on the rise. Nevertheless, the caliber of companies switching is significant.

"Bay Networks was our fourth-largest company when they moved," acknowledges Marc Beauchamp, a spokesman for Nasdaq in Washington. "But a good 1,000 Nasdaq companies meet the NYSE requirements and could leave, and they don't. A lot of companies grew up on Nasdaq, and they stay."

At a glance

Total value of stock traded in 1995:	$3.08 trillion	$2.4 trillion
Member companies:	2,675	More than 6,000
Combined market capitalization:	$6.01 trillion	$1.2 trillion

The high-tech touch

These companies seem to stay because they like the high-tech orientation of Nasdaq. One prominent example is Microsoft.

"We evaluate which exchange would be best for our shareholders from time to time and will continue to do so ... [We've stayed with Nasdaq for] several reasons," explains Mike Brown, vice president of finance and CFO at Microsoft in Redmond, Wash. "It's an 'over-the-computer' vs. a floor-based exchange, and, of course, this fits our orientation, as well. It has been the principal IPO market for new issues during most of the 20-year PC revolution, and we believe encouraging and supporting a vigorous capital market has been, and will continue to be, good for our overall industry."

Bort is a freelance writer in Dillon, Colo.

The Week in Stocks

Gainers

Systemsoft Corp. (H)	66.8
Netmgt Corp. (H)	39.1
IPL Systems Inc.	89.5
Encotec Corp.	73.3
Peter Systems	23.0
Computer Network Tech.	34.2
Compression Corp. (H)	28.6
FTP Software Inc.	26.6

Losers

LSI Logic Corp.	-10.5
Compuserve Corp.	-16.7
Business Objects	-16.8
Red Brick Systems Inc.	-16.6
Informix Inc.	16.1
Pixtech	-13.5
Xilinx	-13.7
Computer Hardware	-13.0

Systemsoft Corp. (H)	66.8
Netmgt Corp. (H)	39.1
Compuserve Corp. (H)	28.6
IMS Systems Inc. (H)	5.63
Xircom Corp. (H)	5.00
Cambridge Tech. Partners (H)	5.00
Encotec Corp.	4.00
CompUSA Inc. (H)	3.50

Cabletron Systems	-8.50
LSI Logic Corp.	-8.13
Business Objects	-7.50
Red Brick Systems Inc.	-7.00
Adobe Software	-6.75
Pixtech Corp.	-6.25
Computer Hardware	-5.00
Computer Associates (H)	-5.00

Industry Almanac

Fault-tolerant stock?

Sometimes a company pays so much attention to what is happening on its own workbenches that it doesn't see the world rapidly changing around it. Stratus Computer, Inc. (NYSE:SRA) has experienced this phenomenon with its high-end, fault-tolerant computer systems, analysts say.

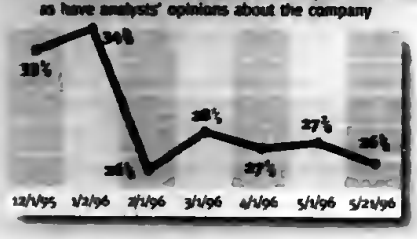
At one time, Stratus' fault-tolerant line competed with similarly high-priced systems from **Tandem Computers, Inc. (NYSE:TDM)** and **Sequoia Systems, Inc. (Nasdaq:SEQS)**. Over the past several years, however, these systems have been drastically undercut by much lower-priced "crash-resistant" systems from **Hewlett-Packard Co. (NYSE:HWP)** and **Sun Microsystems, Inc. (Nasdaq:SUNW)**. Analysts have mixed feelings about how Stratus has responded.

The long-term growth rate in Stratus' core business has slowed drastically, says William Milton, an analyst at Brown Brothers Harriman & Co. in New York. "Stratus has shown no earnings growth since 1991," he says. "They usually attribute this to 'product transition,' but that excuse wears a little thin after five years." Milton gives the stock a market perform/hold rating. "All of the growth in this area is in systems that cost less than $50,000, and I don't think Stratus is equipped to make a transition to that level easily," he explains.

Michael Geran, an analyst at Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J., doesn't see things quite so bleakly. Stratus' restructuring and refocusing process has been more difficult than it expected, Geran says. But the company's new product lines "should put them on the road to improved results somewhat later this year or early next year," he says.

Geran adds that Stratus' long-term success depends on whether customers are still willing to pay a slightly higher premium for the company's new lines. He currently has an accumulate rating on the stock. — *Stewart Deck*

Stratus Computer's stock price has been up and down as have analysts' opinions about the company



Exch	52-Week High	52-Week Low		May 24 Wk Net	Wk Pct Change
COMS	53.63	30.50	3 COM Corp	50.00	1.50	3.0
ART	66.88	42.25	ABBOTTECH Corp	59.75	1.63	2.8
AXE	22.13	15.63	Adaptec Intl	17.38	3.13	-0.1
APTS	17.13	3.75	Apertus Tech	4.00	-0.50	-11.1
T	80.88	49.13	AT & T	63.00	1.25	2.0
ASND	71.25	9.25	Ascend Communications (H)	66.25	3.63	5.2
BNYN	18.63	6.00	Banyan Systems Inc	9.00	1.25	14.5
BAY	80.00	73.88	Bay 30 Twoom's Inc	30.13	3.88	-0.7
BEL	80.38	43.50	Bell Atlantic Corp	63.75	-0.38	-0.6
BLS	45.88	39.13	Bellsouth Corp	41.63	0.50	1.2
BRKT	69.00	9.13	Brooktrout Technology	44.50	1.50	3.5
CS	107.75	80.63	Cabletron Systems	77.13	-8.50	-9.9
CSCC	120.50	20.63	Cascade Communications	113.75	1.75	1.5
CSRN	75.13	12.75	Centigram Communications	17.50	0.38	2.2
CSCO	57.15	21.13	Cisco Systems Inc	57.13	1.00	1.8
CLIX	11.38	6.50	Compression Labs Inc	7.50	0.88	13.2
CMNT	8.75	4.00	Computer Network Tech.	8.75	1.63	22.8
JCOM	14.38	8.75	CrossCom	10.81	0.44	4.2
DIGI	44.00	21.88	DSC Communications	30.88	-2.11	-6.6
FORE	89.25	75.50	FORE Systems Inc. (H)	80.50	1.75	2.0
GDC	21.88	9.88	General Datacomm Inds.	16.25	-2.13	11.8
GSIX	42.38	30.00	General Signal 30 Twoms	30.00	-0.38	-1.0
GTE	50.25	32.13	GTE Corp	46.88	-0.50	-1.1
LU	38.25	30.75	Lucent Tech. (H)	37.75	2.25	6.3
MCIC	31.13	19.00	MCI Communications Corp	30.88	0.75	2.6
MCW	14.38	5.50	MCOM Communications Corp	11.25	0.00	0.0
MNPI	16.50	9.63	Microcom Inc	19.38	-3.19	-16.1
NETM	34.00	9.38	30 Networks Inc.	17.25	3.00	20.5
NT 88	8.75	1.63	30 Net Corp	7.25	0.00	0.0
NCDI	12.00	3.00	Network Computing Devices	3.50	0.00	0.0
NWK	42.00	31.00	30 Twoom Equipment Tech.	38.25	-0.63	-2.2
30TG	47.50	22.88	30 Twoom General	42.00	-0.13	-0.3
NN	71.88	75.00	30 Networks 30 Twoom's Corp (H)	73.75	3.63	3.7
NT	54.00	31.50	Northern Telecom Ltd. (H)	54.00	2.63	5.1
NOVL	23.25	11.38	Novell Inc.	15.44	0.50	3.8
NYN	58.25	39.25	Nynex Corp	42.00	-0.61	-1.3
OCTL	26.25	11.63	Octel Communications Corp	25.25	-0.25	-1.0
ODSI	43.75	17.38	Optical Data Systems Inc.	23.88	-0.13	-0.5
PAC	35.25	25.63	Pacific Telesis	33.88	0.15	0.6
PCTL	44.72	20.75	Picturetel Corp	32.75	0.65	1.7
PTON	10.75	4.75	Proteon Inc.	5.94	0.00	1.3
RACO	7.88	3.88	Racotek Inc.	6.38	0.63	10.9
3RTX	10.88	1.81	Retix (H)	9.75	-0.50	-4.9
SBC	38.25	42.75	SBC Communications	50.13	0.38	0.8
SFA	23.38	11.38	Scientific Atlanta Inc.	19.50	0.38	1.9
SMVA	73.00	18.13	Shiva Corp. (H)	22.25	3.25	4.3
PON	46.38	29.25	Sprint Corp	43.75	0.63	1.4
SMSC	23.38	12.50	Standard Microsystems Corp	16.50	-0.38	2.2
STRM	56.75	16.00	Stratacom Inc	50.69	0.94	1.2
TBIT	11.25	2.38	Telebit Corp	8.88	-0.63	-6.0
USRX	109.50	20.38	US Robotics (H)	30.50	2.50	2.3
USW	48.38	28.38	US West Inc	33.63	0.13	0.4
XIRC	17.50	8.88	Xircom	15.75	-0.38	-2.3
XYLN	76.00	51.25	Xylan Corp (H)	67.50	-0.50	-0.7

AALG	10.38	5.63	Advanced Logic 30 Search (H)	9.75	1.13	13.0
AAPL	50.13	23.00	Apple Computer Inc	50.75	-1.25	-4.5
ASTC	19.00	6.63	AST Research Inc	7.63	0.38	4.2
CPQ	56.75	35.88	Compaq Computer Corp	38.38	0.83	1.5
DELL	51.75	23.00	Dell Computer Corp	49.75	2.50	5.3
GATE	30.75	17.38	Gateway 2000 Inc	36.63	-0.25	2.8
HWP	115.38	64.13	30 Hewlett Packard Co	105.88	-2.25	-2.1
MUEI	50.88	9.00	Micron International Inc	16.00	1.00	13.3
NBPVF	75.13	51.00	30 Com Inc	56.38	-3.63	-6.0
SGI	65.63	31.13	Silicon Graphics	38.38	-1.38	-4.6
SUNW	61.63	19.75	Sun Microsystems Inc. (H)	61.63	3.94	5.0

AAHH	13.63	6.75	Abraxas Corp	12.25	0.63	5.4
DGN	19.13	7.50	Data General Corp	15.13	0.38	2.5
DEC	76.50	35.13	Digital Equipment Corp	52.38	-4.00	-7.1
IBM	120.88	83.13	IBM	108.75	-2.38	-2.1
MDCD	50.25	1.25	Meridian Data Inc (H)	18.13	-0.88	-4.6
3DTF	7.50	3.88	3D Systems	5.00	0.00	0.0
SQNT	75.38	10.13	Sequent Computer Sys	14.00	-0.75	-1.8
SEQS	30.00	7.88	Sequoia Systems Inc	3.25	0.00	0.0
SRA	30.13	23.00	Stratus Computer Inc	27.13	0.25	0.9
TDM	17.50	8.38	Tandem Computers Inc.	12.75	-0.50	-3.8
TRCD	6.94	2.00	Tricord Systems	5.94	0.44	8.9
UIS	13.63	5.38	Unisys Corp	8.00	0.00	0.0

ADBE	74.25	30.00	Adobe Systems Inc	40.69	2.69	6.2
AMSWA	8.75	3.50	American Software Inc	4.88	-0.11	-2.5
APLX	62.50	8.25	Apple Inc.	34.00	1.75	4.9
ARSW	82.75	28.75	Arbiter Software	30.88	-6.75	-10.3
ACAD	53.00	27.25	Autodesk Inc	30.75	0.00	0.0
BACH	13.88	4.63	Bachman Info. Systems	8.00	0.13	1.6
BGSS	62.75	50.00	BGS Systems Inc. (H)	62.75	5.63	15.2
BMCS	67.75	31.75	BMC Software Inc	66.00	0.50	0.8
BOOL	26.75	19.25	Boole and Babbage	25.00	-0.75	-2.9
BORL	21.25	10.13	Borland Int'l Inc.	15.50	-0.38	-2.4
BOBY	55.50	15.25	Business Objects	45.50	7.75	18.6
CYC	27.00	13.63	Cheyenne Software Inc.	22.13	-0.38	-1.7
COGNF	27.38	8.25	Cognos Inc	24.25	0.00	0.0
CA	82.13	37.25	Computer Associates (H)	72.88	5.63	8.4
CVIS	15.50	6.88	Computervision Corp	11.13	1.13	9.2
CPWR	37.63	15.50	Compuware Corp (H)	30.63	6.65	22.1
CSAPL	30.00	11.13	Consumate Sft (H)	30.75	1.50	5.1
CORF	19.50	8.38	Corel Corp	13.25	0.63	5.0
DWTI	15.75	5.75	Datawave Technologies Inc.	6.50	-0.75	-3.7
DSLGF	12.75	8.00	Discreet Logic Inc	8.25	-0.88	-9.8
FILE	62.00	30.75	Filenet Corp	47.50	-6.25	-11.6
DDDDF	8.25	1.50	Ftn Distribution	5.88	0.13	2.2
FTPS	30.63	8.13	FTP Software Inc	11.63	2.00	31.6
GSOF	50.00	7.38	Group1 Software	10.00	0.00	0.0
GPTA	12.13	4.13	Gupta	5.00	0.00	0.0
HUMI	50.88	37.00	Hummingbird Comm. Ltd.	31.75	-0.11	-0.5
HYSW	28.38	9.75	Hyperion Software Corp	13.88	0.25	1.8
IFIC	18.63	10.00	Information Resources	12.75	-0.88	-6.4
IFMX	16.75	16.00	Informix Corp	50.88	2.13	-9.2
INGR	20.15	16.88	Intergraph Corp	13.63	-0.38	-2.7
LEAF	12.63	5.38	Interleaf Inc.	8.13	0.25	3.2
ISLI	26.25	8.75	Intersolv Inc.	10.13	-3.00	-9.0
INTU	89.25	50.63	Intuit Inc	51.50	3.50	-8.4
LGWX	22.25	30.88	Logic Works	15.63	2.50	17.9
MANU	50.50	9.50	Manugistics Group Inc.	30.38	1.19	7.9
MAPS	30.00	30.00	Maplin Corp	16.75	0.63	3.9
MATH	9.25	3.75	MathSoft	8.00	0.38	4.9
MCAF	43.88	12.13	McAfee Associates	30.38	-3.00	-5.0
MENT	37.88	30.88	Mentor Graphics	38.00	-0.11	-0.7
MFGY	31.25	8.25	Micro Focus	14.75	0.83	6.6
MICN	18.63	6.00	Micrografx Inc. (H)	17.75	-0.25	-4.3
MSFT	150.00	50.00	Microsoft Corp	118.63	1.00	3.6
ORCL	38.25	22.13	Oracle Corp	33.38	-2.00	-5.7
PMTC	45.25	20.88	Parametric Technology (H)	43.00	-1.00	-4.4

PARQ	14.50	6.63	ParcPlace Systems Inc	13.88	1.38	11.0
PSFT	75.25	24.38	Peoplesoft	69.50	0.25	0.8
PTEC	38.75	8.63	Phoenix Technologies	18.00	1.50	9.1
PSQL	16.88	3.38	Platinum Software	11.13	-0.88	-7.3
PLAT	26.00	11.75	Platinum Technology	37.13	-0.31	1.8
PRGS	38.00	14.63	Progress Software Corp	36.63	0.00	0.0
RNBO	24.75	16.63	Random Technologies Inc	22.38	0.88	4.1
RBDB	61.00	29.50	Red Brick Systems Inc.	41.75	-7.00	14.4
ROSS	7.75	2.19	Ross Systems	2.56	5.38	22.9
SCOC	12.15	5.50	SCO Inc.	7.88	1.00	11.3
SDTI	95.75	17.63	Security Dynamics Tech (H)	87.75	-4.75	5.1
SKEY	51.75	33.38	Softkey International Inc	36.00	-3.13	-10.7
SPCO	5.13	1.19	Software Publishing Corp	3.63	-0.13	-4.5
SQAI	38.75	16.00	SQA Inc. (H)	35.50	3.00	9.2
SOTA	18.63	6.65	State of the Art	18.63	0.63	3.5
SSW	80.75	33.75	Sterling Software Inc (H)	78.88	3.00	1.3
SDRC	37.38	30.38	Struct. Dynamics Research	30.13	1.38	4.8
SYBS	39.75	30.88	Sybase Inc	25.00	-2.00	-7.4
SYNC	31.25	0.88	Symantec Corp	14.69	-0.31	3.8
SNPS	80.25	23.00	SynOpsys	80.25	1.13	2.5
SSAX	50.63	12.63	System Software Assoc.	18.00	-0.88	-4.6
SYSF	50.00	8.75	Systemsoft Corp (H)	50.00	14.75	41.8
TRUV	30.13	4.00	Truevision Corp	8.63	-0.50	-5.5
VIEW	17.50	9.63	Viewlogic Systems	35.94	-0.50	-1.4
VMKR	21.50	5.75	Vmark Software Inc.	12.13	0.13	1.0
WALR	12.75	4.63	Walker Interactive Systems	12.00	0.83	5.5
WALL	23.75	13.00	Wall Data Inc.	23.00	1.88	8.9
WANG	26.13	12.38	Wang Laboratories Inc.	23.38	-0.38	-1.6

AMER	71.00	16.75	America On-Line	51.50	7.00	3.7
BBN	48.75	30.50	BBN Corp	27.88	-0.63	-2.2
CSRV	35.50	33.00	Compuserve Corp	23.00	-4.63	-16.7
LCOS	50.25	14.00	Lycos Inc	17.00	1.00	-5.6
NETC	91.50	19.22	30 Com On-Line	30.50	-1.75	-4.2
NSCP	87.00	22.88	Netscape Comm. Corp	74.00	2.00	2.8
PSIX	50.00	6.75	PSINet	36.00	-3.50	-11.5
QDEK	39.50	6.88	Quantaware Corp	15.63	1.25	8.7
RAPT	30.75	22.75	Raptor Systems	31.00	-0.25	-0.8
SCUR	64.50	19.00	Secure Computing Corp	28.50	3.00	11.8
SPYG	62.00	13.75	Spyglass Inc	26.50	2.75	7.8
UUNT	58.75	25.75	UUNET Tech.	62.00	-2.00	3.1
YHOO	43.00	24.50	Yahoo! Inc.	38.50	-0.75	2.5

AMD	30.75	16.15	Advanced Micro Devices	17.50	1.63	-8.5
ADI	50.13	27.50	Analog Devices Inc	37.88	-0.75	3.6
CHPS	15.88	7.88	Chips and Technologies	10.61	-1.38	-11.5
CRUS	61.13	17.00	Cirrus Logic	21.38	-2.63	-10.9
CY	27.75	20.00	Cypress Semiconductor Corp	13.65	-0.88	-6.0
CYRX	60.75	18.25	Cyrix	32.50	-1.25	-6.5
INTC	78.38	69.81	Intel Corp	75.06	-0.56	-0.7
LSI	62.50	22.50	LSI Logic Corp	30.63	-8.13	-21.5
LSCC	43.00	26.38	Lattice Semiconductor	31.00	3.50	10.1
MCRL	33.50	13.25	Micrel Semiconductor Inc.	16.50	1.50	-8.1
MU	104.75	27.50	Micron Technology	30.75	-3.13	-9.4
MOT	82.50	44.75	Motorola Inc	65.15	0.38	0.6
NSM	33.63	13.50	National Semiconductor	16.25	0.13	0.0
TXN	83.75	42.75	Texas Instruments	50.88	3.50	4.4
TRCC	21.63	7.00	Transwitch Corp. (H)	10.88	-0.50	-2.6
VLSI	39.13	30.75	VLSI Technology	17.63	-1.38	-7.2
WWTE	5.88	1.00	Wavetek	1.44	0.00	-4.2
WDC	29.00	14.50	Western Digital Corp. (H)	20.63	-1.38	-4.9
XLNX	55.50	23.25	Xilinx	30.88	-4.50	-12.3
ZLG	16.13	28.50	Zilog Inc.	16.13	-0.50	1.4

APCC	25.00	7.00	American Power Conversion	11.75	-0.19	1.6
ADPT	62.00	50.75	Adaptec Inc.	50.63	0.88	1.5
CDEX	33.13	5.00	Cadmus Corp	6.75	0.75	12.5
CGN	7.25	3.00	Cognitronics Corp	4.00	0.25	9.5
CREAF	34.13	5.75	Creative Technologies Inc.	8.19	-0.50	-3.5
RACE	33.13	3.61	Data Race Inc	4.50	0.00	0.0
DTRO	9.38	4.13	Dataram Corp	5.94	-0.38	-5.9
EMC	27.38	13.00	EMC Corp	22.00	0.88	4.1
EMUX	28.50	6.38	Emulex Corp	21.25	4.00	53.2
ESCC	26.50	13.75	Evans and Sutherland	26.63	0.38	1.4
EXBT	32.75	10.00	Exabyte	20.50	0.25	1.2
ISLF	4.25	1.50	Intellinet Info. Systems	2.25	0.06	2.9
IOMG	55.00	2.38	Iomega Corp (H)	44.00	10.75	32.3
IPLSA	7.88	2.50	IPL Systems Inc.	7.38	1.50	25.5
KMAG	37.50	19.25	Komag Inc.	33.25	2.50	-7.0
MTSI	50.75	13.25	Micro Technology Systems Inc	19.50	0.75	-3.7
PEAK	16.75	17.25	Peak Technology Group	26.75	0.75	0.9
PMCL	19.75	5.88	Pinnacle Micro Inc.	9.75	1.00	11.4
PTNX	18.75	13.50	Printronix Inc.	27.50	-2.00	-8.2
QMS	6.75	1.25	QMS Inc	6.00	0.13	2.1
QTUM	38.50	15.00	Quantum Corp	26.75	0.75	2.9
RDUS	14.00	0.94	Radius Inc.	3.25	0.25	6.3
SEG	42.75	16.50	Seagate Technology	40.13	-2.88	-4.6
STK	37.00	21.00	Storage Technology (H)	35.13	-0.88	2.6
STLC	8.75	1.25	Stratamagic Corp.	6.69	-0.09	-9.3
TEK	61.88	50.75	Tektronix Inc.	37.88	-0.50	4.3
XRX	140.75	109.38	Xerox Corp. (H)	140.00	5.00	2.2

AMSY	33.38	14.63	American Mgmt Systems (H)	32.38	2.13	7.0
ANLY	43.25	24.75	Analysts Int'l. (H)	43.75	3.00	7.4
AUD	43.38	30.25	Auto Data Processing	38.38	0.25	0.7
CATP	81.75	33.00	Cambridge Tech. Partners (H)	81.00	5.00	6.6
CERI	54.25	31.63	Ceridian Corp. (H)	51.88	1.00	2.0
CDO	28.75	18.88	Condosci Inc.	20.13	0.88	5.2
CHRZ	54.00	8.13	Computer Horizons	44.00	-6.00	12.0
CSC	80.75	50.63	Computer Sciences	75.38	0.13	-0.3
TSK	31.88	10.75	Computer Task Group	29.50	0.50	1.3
CPU	48.25	12.13	CompUSA Inc. (H)	47.50	3.50	8.0
CDAT	27.50	8.63	Control Data Systems Inc.	22.63	0.06	0.3
EGGS	14.25	5.00	Egghead Discount Software	11.50	-0.63	-5.2
GME	59.00	41.50	General Motors E (EDS)	54.38	-3.88	-3.3
IMAC	34.25	8.13	Imagine Corp. (H)	21.00	1.00	5.0
INEL	14.63	3.50	Intelligent Electronics	10.13	0.00	0.0
KEA	43.25	18.75	Keane Inc.	40.00	-0.50	-1.2
MSEL	8.50	2.25	Merisel	4.50	-0.25	-5.2
MICA	15.00	7.25	Micronet Inc.	15.63	-0.50	-3.8
PAYX	47.00	19.17	Paychex	45.75	0.92	2.0
PMS	54.25	42.63	Policy Management Sys.	53.25	0.11	0.2
REY	51.25	28.11	Reynolds and Reynolds (H)	51.13	0.13	0.25
SCBI	30.50	15.75	SCB Computer Tech. Inc. (H)	29.25	3.00	3.36

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Figuring the dollars & sense of intranets

CONTINUED FROM PAGE 1

crazy," said Sheryl Olguin, lead software engineer at Harris Corp. in Melbourne, Fla.

Harris, a $3.4 billion electronic company, runs more than 100 internal Web sites that link 14,000 employees. Although eager techies built many of the applications on lunch hours and at home, the more heavy-duty apps had to undergo formal financial analysis, Olguin said.

For example, an intranet for corporate policies and procedures required technical staff to figure existing costs for printing, updating and mailing. The staff then had to pit those costs against the funds needed to build an intranet.

Harris' Sheryl Olguin: *One intranet may save the company $50,000 annually*

"Not until we had dollar signs on a piece of paper did we go ahead with" the plan, Olguin said. The application is expected to save Harris $50,000 annually, she said.

Escape route

But many other intranet users have so far ducked financial hassles, *Computerworld*'s survey found. That is mainly because of the low cost of required gear, users noted. For example, users can download various freeware server software from the Internet. And the No. 1 commercial Web server vendor, Netscape Communications Corp., offers its FastTrack server for $295 — less than a night at some Honolulu hotels.

Most shops also have an extra machine lying around that is underused. Personnel time is a consideration, but intranets are easier to maintain — at least so far — than most applications, said Don Ryan, an analyst at Meta Group, Inc. in Stamford, Conn. "It's not like companies are being forced to make multimillion-dollar decisions to get into this stuff," he said.

Still, some big bucks have been invested. And where that happens, so does cost-justification.

Managers at Kraft Foods, Inc. in Northfield, Ill., for example, insisted that Karen Isaacson come up with dollars and sense before approving her plans for a human resources intranet early this month.

The project, which will cost less than $250,000, will ultimately give Kraft's 43,000 employees the ability to update most of their own records for information such as benefits and personal data, via Netscape's Web browser.

Kraft a few years ago considered establishing kiosks at its 100 locations companywide for a similar application. But high costs killed the idea.

Including hardware, software, installation, programmer time and ongoing maintenance, kiosks would have cost $100,000 each, or $10 million overall, Isaacson said.

Isaacson, who is associate director of human resources IS at Kraft, got the go-ahead for the intranet on promises that it would free up human resources workers who were doing data entry to do more meaningful work, such as human resources counseling.

Another possible outcome, she acknowledged, was that some workers would be cut from the ranks.

Isaacson also impressed her managers when she advised that IS take control of Internet technology at Kraft to avoid playing catch-up to power users later on. "We don't want to repeat what we already went through in the '80s, where cute little LANs and PCs popped up everywhere that [IS had] to consolidate down the road," she said.

Other users have given skeptics a small taste of intranet living to whet their appetites for meatier projects.

Intranets

A new monthly publication and Web-zine
Look for it June 24 in Computerworld

Did you have to cost-justify your intranet project?

Base: 100 IS professionals that have intranets at their companies

Source: Exclusive Computerworld survey

For less than $3,000, BC Hydro Corp. piloted an intranet early this year that would replace a 200-page IS manual printed for 140 people, four times a year.

That application is expected to save at least $5,000 per year in printing and distribution costs.

It also helped webmaster Steve Whan make a case for more complicated plans to move IBM mainframe-terminal applications for project management and budgeting to intranets this year, he said.

New ways to work

Further, intranets aren't so much about big hardware and software purchases as they are about changing the way work happens, users and analysts explained.

Return on investment, for example, "is not always cash," advised Harry Fenik, an analyst at Zona Research, Inc. in Redwood City, Calif. Payback can more often be a better way of working, he said.

"It's a touchy-feely thing at our company," said Gary Stedman, a technology planner at Imperial Oil Ltd. in Calgary, Alberta. "When you sit a business guy down with Web access and show him how he can find out about the competition, get stock prices, meld it all into an internal report he's working on, then post it internally so his salesmen on the road can see it, what's not to like?"

Armed with evidence

Access Health, Inc. took intranet cost-justification to the max.

John Determan and Marc Houston, technical support analysts at the health care information firm in Rancho Cordova, Calif., knew they wouldn't get an OK from managers until they could show exactly what gains an intranet could provide.

They calculated details such as time spent walking to and from meetings and the annual cost of buying toner cartridges for printers.

One analysis went like this: Say the average Access Health employee makes $38,000 per year. That translates to roughly 30 cents per minute, given a 40-hour work week, 50 weeks per year.

If 50 of those workers could avoid one 30-minute meeting 86 times per year by fetching information from an intranet, that's $38,700 worth of time saved annually — enough to add another full-time worker.

Determan and Houston went a step further. They reasoned that not every user will drop old habits when an intranet appears.

In their proposal, they figured savings based on realizing 25% of their time and money projections in the first six months, then 50% in the first year and nearly 100% after two years of the intranet's debut.

"I tried to turn time into dollars and be conservative, and I hope that goes over well," Determan said. A decision is expected by August.

Meanwhile, he and Houston continue to build intranets on their own time to further the cause. — *Kim S. Nash*

What is your involvement with intranet applications?

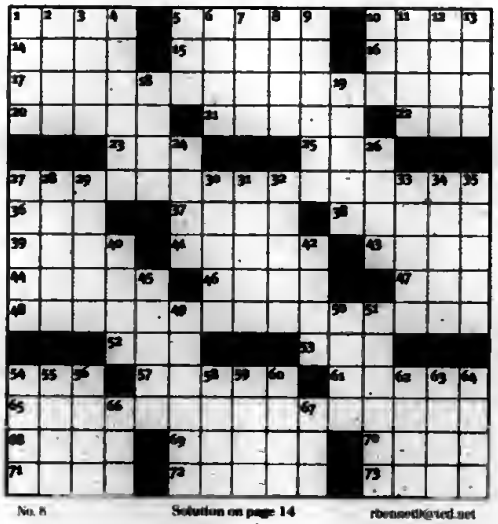
Base: 100 IS professionals with intranets at their companies; multiple responses allowed. Top 5 answers listed

Sharper Image beefs up its Web site. See page 63.

He said what!

Computerworld crossword by Rick Bennett

Did the man who invented minicomputers really do it on purpose, or did he just blither into the history books? You be the judge.



No. 8 — Solution on page 14 — roensetd@ved.net

ACROSS

1 Knock
5 Decapod crustaceans
10 Enclosure for SMP servers
14 Phil ___, former CIA
15 A bundle of sticks and branches bound together
16 Young woman (French, abbr.)
17 START OF QUOTE
20 One who accepts a bet
21 Small stuffed pastry (Yiddish)
22 A fertility goddess in ancient mythology
23 Piece of advice
25 ___ Vegas
27 QUOTE PART 2
36 Sweet ___
37 Chart type, for managers
38 Self-immolation by fire rituals
39 Ultimate degrees
41 By the –; how software is licensed on a network
43 ___ Turner, rock singer
44 A noteworthy period
46 Remain as is
47 Ford model
48 QUOTE PART 3
52 Engine additive
53 Berlin yes
54 Don't know when yet, for short
57 Blacks
61 A way to burn
65 END OF QUOTE, ITS AUTHOR, AND THE CO. HE FOUNDED
68 Assortment
69 Cricket frogs
70 All the persons specified, considered individually
71 Mounted soldier
72 Arizona city
73 '70s fad, abbr.

DOWN

1 Large force, Mil.
2 Turkish title
3 Try to locate
4 To this
5 Shipping overhead, for short
6 Uttering in an irritated tone
7 God of fire (Hindu)
8 Crude, uncouth ill-bred person
9 Take a walk
10 What you need before you can return mail-order computer, abbr.
11 Too
12 Sound of a horse's hoof
13 Cognizances
18 Emerald Isle
19 Good gosh!
24 Makes lively
26 Kind of team
27 Sleep disorder caused by snoring
28 Web device
29 Popular Internet search engine
30 Most teensy
31 Speak
32 Express verbally
33 Skewed
34 Last inning of regular play
35 Hebrew letter
40 Whose old typewriter brand, abbr.
42 CEO-support teams, abbr.
45 Two sets of Beaverton, Ore., high-tech corporate inits.
49 Pollyannaish
50 Belgian river
51 Harnessed
54 Biblical pronoun
55 Cotton pod
56 Type genus of the Amiidae
58 Start of a nursery rhyme
59 "Cheers" barfly
60 Woman's undergarment
62 Agmts. to protect technology
63 Computer lessor inits.
64 Repeat
66 A long period of noteworthy time
67 Chicago to Miami compass direction

Inside Lines

Microsoft: We took it back!

Fumbling fingers at Microsoft early last week mistakenly posted to the Internet a pre-beta copy of the company's forthcoming browser upgrade. Several alert surfers — roughly 100, according to one in the know — snapped up the rogue copy of Internet Explorer 3.0 before Microsoft noticed the error. First impressions from one user who posted a message to Usenet: It's fast but doesn't fully support Java yet.

Mainframe Windows?

IBM and Bristol Technology this week will announce that they've started to build an OS/390 version of Bristol's Wind/U. The mainframe version of Bristol's tool kit, which uses Microsoft source code for porting Windows applications to other platforms, will start beta-testing this fall and will eventually support a distributed version of OLE. Neither IBM nor Bristol would say how much mainframe Windows will cost.

Dial-A-Commute

Don Cantwell, the affable CEO at Dial-A-Mattress, has stepped down to become chief information officer at Graham-Field Healthcare, a Hauppauge, N.Y., maker of diagnostic and surgical instruments. Cantwell said he switched jobs because he just bought a historic farmhouse that was built by a descendant of Smithtown, N.Y., founder Obadiah Smith in 1760. Chez Cantwell is a mere four-mile commute to Graham-Field, while his commute to Dial-A-Mattress in Long Island City, N.Y., was often three hours or more round-trip.

But where are the refrigerator magnets?

It's being billed as the "first full-scale information technology exhibition to be modeled entirely in virtual reality without a physical presence." Virtex will open live on the Internet in October and will be sponsored by Electronic Telegraph (www.telegraph.co.uk/), the Internet version of *The Daily Telegraph*. Vendors that have already committed to the virtual trade show include IBM, Computer Associates and Cisco. The five "halls" of the show will house networking/intranet, Internet/desktop 2000, document management/groupware, data warehousing/electronic commerce and security.

The 5th Wave by Rich Tennant

Faster than a speeding Ethernet . . .

NBase Communications in Chatsworth, Calif., this week will announce one of the industry's first 1G bit/sec. Ethernet uplink products. The Gigabit Ethernet module will ship in the fourth quarter, priced at less than $2,500. It enables users to link the company's 10M to 100M bit/sec. MegaSwitch II to a 1G bit/sec. backbone network. Gigabit Ethernet is 10 times faster than Fast Ethernet.

Signed, sealed and delivered

FedEx and Hewlett-Packard this week plan to announce a deal for FedEx to buy up to 100,000 PCs, 400 Unix servers and 600 workstations from HP over the next five years, sources said. FedEx will use the HP machines in customer service applications that currently run on mainframes and 3270 terminals, the sources said. Some of the PCs will be installed at high-volume customers to enable them to better track package shipments and deliveries. The companies declined to comment on the deal.

His online handle was Rita in the "married but looking" chat area of America Online. The married men flocked to Rita, flirting on the open channel and steaming up a private chat room. At least a dozen sent Rita address information so they could receive provocative photos. But all they got was a letter from "Rita's husband" with a printout of their erotic online exchanges and a demand for payment to keep the transgression private. The assistant U.S. attorney prosecuting "Rita" for extortion last week said, "It's an old crime, just new tools." If any of your new tools or suppliers have been acting like criminals lately, contact news editor and part-time prosecutor Tish Keefe with your tips at (508) 820-8183 or via the Internet at patricia_keefe@cw.com.

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